Author: State Horticultural Association of Pennsylvania

Title: Proceedings of the State Horticultural Association of Pennsylvania...1922

Place of Publication: Harrisburg, Pa.

Copyright Date: 1922

Master Negative Storage Number: MNS# PSt SNPaAg229.5

1922

PROCEEDINGS

OF THE

STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA

FOR

1922

SIXTY-THIRD ANNUAL MEETING
HELD IN HARRISBURG
JANUARY 25, 1922

State Horticultural Association of Pennsylvania
Officers for 1922

PRESIDENT

S. W. Fletcher, State College, Pa.

VICE-PRESIDENTS:

C. Arthur Griest, Guernsey, Pa.
H. C. Brinton, Hanover, Pa.
H. F. Hershey, Hamburg, Pa.

SECRETARY

W. H. Weinschenk, New Castle, Pa.

SECRETARY VEGETABLE GROWERS SECTION

W. B. Nissley, State College, Pa.

TREASURER

Edwin W. Thomas, King of Prussia, Pa.

MEMBERSHIP SECRETARY

H. A. Schantz, Allentown, Pa.

All Presidents of County Associations certified to by the Secretary of the County Association are Vice Presidents of the State Association. (See article 3 of the Constitution).

EXECUTIVE BOARD

(All of the above named officers)

Legislative Committee

P. S. Fenstermacher, Chairman, Allentown.
C. J. Tyson, Flora Dale.
L. M. Marble, Canton, Pa.

Exhibition Committee

F. N. Fagan, Chairman, State College.
Clarence Keller, Gettysburg.
M. P. Wenger, Denver.
C. E. Treible, Meshoppen.
E. Bane Snyder, Jacks Mt.
W. O. Bingham, St. Thomas.
F. F. Rohlfing, Hummelstown.
W. L. Lewis, Pittston.

Membership Committee

H. A. Schantz, Chairman, Allentown.
W. B. Nissley, State College.
W. A. Hess, Mt. Alto.
H. S. Nolt, Columbia.
A. I. Loop, North East.
F. H. Fassett, Meshoppen
Sheldon Funk, Boyertown.
S. L. Smedley, Jr., Newtown Square.
S. R. Huey, New Castle.

Special Committee to Co-operate with the Bureau of Plant Industry in the Peach Yellows Campaign

R. T. Criswell, Chairman, Chambersburg.
Levi Myers, Siddonsburg.
W. S. Adams, Aspers.
L. H. Crossman, Oaks.
J. M. Balthaser, Wernersville.

Committee to co-operate with the State Chamber of Commerce in studying the needs of the Pennsylvania State College in Agricultural Research.

Abraham Hostetler, Johnstown.
P. S. Fenstermacher, Allentown.
W. J. Lewis, Pittston.
William H. Peck, Scranton.
J. W. Pricket, Aspers.
W. H. Weinschenk, New Castle.
A. Blaine Robinson, North East.
Howard Anderson, Stewartstown.
L. H. Crossman, Oaks.
L. M. Marble, Canton.
Thed Pershing, Pineville.
S. H. Starkey, Bustleton.
James S. Walker, Westtown.
D. M. Wertz, Waynesboro.
R. H. Garrahan, Kingston.

General Fruit Committee

R. D. Anthony, Chairman, State College.

MEMBERSHIP

Life Members

Adams, W. S. ..... Aspers, Pa.
Anderson, H. W. ..... Stewartstown, Pa.
Anwyll, Harry L. ..... Harrisburg, Pa.
Atkinson, D. W. ..... Media, Pa.
Atwater, Richard M. ..... Chadds Ford, Pa
Banzhaf, W. H. ..... Muncy, Pa.
Bartram, Frank N. ..... Kennett Square, Pa.
Bartram, G. Morris ..... West Chester, Pa.
Bartram, George ..... West Chester Pa.
Baugher, George L. ..... Aspers, Pa.
Baugher, H. G. ..... Aspers, Pa.
Bell, H. R. ..... State College, Pa.
Bennett, Eugene B. ..... Easton, R. D. 3, Pa.
Blaine, George W. ..... North East, Pa.
Blair, Charles P. ..... Monaca, Pa.
Blessing, David S. ..... 4 N. Court St., Harrisburg, Pa.
Boles, McClellan T. ..... Hanlin Station, Pa.
Boltz, Peter R. ..... Lebanon, Pa.
Boyer, John F. ..... Middleburg, Pa.
Breidenbaugh, H. L. ..... Boyertown, Pa.
Brinton, H. C. ..... Hanover, Pa.
Brinton, S. L. ..... West Chester, Pa.
Cation, William R. ..... Orrtanna, Pa.
Chase, Charles T. ..... Bala, Pa.
Chase, Howard A. ..... Mt. Pocono, Pa.
Cooper, C. A. ..... 1000 Highland Ave., Coraopolis, Pa.
Corcoran, Paul J. ..... New Albany, Pa.
Crouse, E. A. ..... Gettysburg, Pa.
Cummings, Joseph F. ..... Sunbury, Pa.
Davenport, Eugene ..... Plymouth, Pa.
Dickson, B. M. ..... 5711 Elgin Ave., Pittsburgh, Pa.
Dill, Robert ..... North East, Pa.
Dunlap, James M. ..... Shippensburg, Pa.
Dunlap, R. Bruce ..... Hollidaysburg, Pa.
Eldon, Robert M. ..... Aspers, Pa.
Engle, Enos B. ..... Harrisburg, Pa.
Engle, John G. ..... Marietta, Pa.
Espe, August V. ..... Perrysville, Pa.
Evans, W. H. ..... Plainsville, Pa.
Fassett, F. H. ..... Meshoppen, Pa.
Filbert, R. J. ..... Fox Chase, Pa.
Fletcher, Dr. S. W. ..... State College, Pa.
Ford, A. E. ..... Glen Riddle, Pa.
Fox, Cyrus T. ..... Reading, Pa.
Freed, A. J. ..... Racine, Pa.
Freed, W. A. ..... Racine, Pa.
Garrahan, R. H. ..... Kingston, Pa.
Garretson, Eli P. ..... Biglerville, Pa.
Good, C. W. ..... Waynesboro, Pa.
Griest, C. A. ..... Guernsey, Pa.
Griest, Frederick E. ..... Flora Dale, Pa.
Grove, W. E. ..... York Springs, Pa.
Haddock, John C. ..... Wilkes-Barre, Pa

Hall, L. C. ..... Fairview, Pa.
Hartman, D. L. ..... Little River, Florida.
Hartman, George R. ..... Biglerville, Pa.
Hartman, L. E. ..... Etters, Pa.
Haverstick, Paul E. ..... Lancaster, Pa.
Hawkins, Charles A. ..... York, Pa.
Heard, R. E. ..... Buffalo, N. Y.
Hershey, H. F. ..... Hamburg, Pa.
Hill, William D. ..... North East, Pa.
Hoopes, Abner ..... West Chester, Pa.
Hoopes, Wilmer W. ..... West Chester, Pa.
Hostetler, Abram ..... Johnstown, Pa.
Huey, S. R. ..... R. D. 3., New Castle, Pa.
Huff, Burrell R. ..... Greensburg, Pa.
Huff, L. B. ..... Greensburg, Pa.
Johnston, Mrs. F. C. ..... Dallas, Pa.
Jones, J. F. ..... Lancaster, Pa.
Jones, S. Morris ..... West Grove, Pa.
Keller, C. S. ..... Gettyysburg, Pa.
Keller, H. M. ..... R. D. 5., Gettysburg, Pa.
Keller, Paul J. ..... Gettysburg, Pa.
Kessler, George W. ..... Tyrone, Pa.
Kister, U. G. ..... Etters, Pa.
Koehler, Paulus E. ..... Monaca, Pa.
Landis, D. M. ..... R. D. 7., Lancaster, Pa.
Landis, Israel ..... Lancaster, Pa.
Large, Miss Catherine S. ..... Orrtanna, Pa.
Lawrence, Schuyler ..... 109 Main St., Towanda, Pa.
Lightner, William A. ..... Landisburg, Pa.
Loop, A. I. ..... North East, Pa.
Lord, John ..... R. D. 1., Wyoming, Pa.
MacNeal, Wm. H. ..... Parkesburg, Pa.
Maffett, Miss M. A. ..... 264 S. Franklin, St., Wilkes-Barre, Pa.
Martin, J. O. ..... Mercersburg, Pa.
Mayer, Guy S. ..... Willow Street, Pa.
Meehan, S. Mendelson ..... Germantown, Pa
Mendenhall, J. Howard ..... Glen Mills, Pa.
Metzger, Dr. A. H. ..... Lafayette, Alabama.
Moon, Henry T. ..... Morrisville, Pa.
Muller. Adolph ..... Norristown, Pa.
Myers, Levi M. ..... Siddonsburg, Pa.
McClellan, J. B. ..... Canonsburg, Pa.
McFarland, J. Horace ..... Harrisburg, Pa.
McKee, J. M. ..... Washington, Pa.
McLanahan, J. King ..... Hollidaysburg, Pa.
Nicodemus, Ed. ..... Waynesboro, Pa.
O'Connor, Haldeman ..... 13 N. Front St., Harrisburg, Pa.
Page, C. M. ..... Ely, Pa.
Pennebaker, William M ..... Virgilina, Va.
Pierce, H. W. ..... Wilkes-Barre, Pa.
Pratt, B. G. ..... % Pratt Chemical Co.,New York
Rohde, William ..... Johnstown, Pa.
Runk, J. A. ..... Huntingdon, Pa.
Rush, Perry M. ..... Rogersville, Pa.
Rankin, Charles C. ..... West Chester, Pa.
Reist, John G. ..... Mt. Joy, Pa.
Rick, John ..... Reading, Pa.
Rinehart, E. S. ..... Mercersburg, Pa.
Roberts, Horace ..... Morestown, Pa.
Robinson, A. Blaine ..... North East, Pa.

Satterthwaite, Frederick G. .....Yardley, Pa.
Schuyler, Lawrence .....109 Main St., Towanda, Pa.
Searle, Alonza T. .....Honesdale, Pa.
Settlemeyer, C. T. .....Wilmore, Pa.
Shallcross, Frank R. .....Frankford, Pa.
Shank, H. L. .....% Conestoga Stage, Lancaster, Pa.
Sharpe, Miss E. M. .....Accotink, Va.
Smedley, Samuel L. .....2442 Bryn Mawr Ave., West Philadelphia, Pa.
Snavely, H. H .....Willow St., Lancaster, Pa.
Stem, Dr. J. C. .....Lemoyne, Pa.
Strasbaugh, E. F. .....Orrtanna, Pa.
Swank, Luke H. .....Johnstown, Pa.
Taylor, Ralph S. .....325 North Matlack Ave., West Chester, Pa.
Thomas, Charles L. .....King of Prussia, Pa.
Thomas, Edwin W. .....King of Prussia, Pa.
Trexler, Harry C. .....Allentown, Pa.
Tyler, W. D. .....Dante, Va.
Tyson, Chester J. .....Flora Dale, Pa.
Tyson, Edwin C. .....Flora Dale, Pa.
Tyson, W. C. .....Guernsey, Pa.
Walton, Robert J. .....Hummelstown, Pa.
Weaver, Abraham .....Windber, Pa.
Weigel, H. M. .....Harrisburg, Pa.
Weimer, E. A. .....Lebanon, Pa.
Wertz, D. Maurice .....Waynesboro, Pa.
Wertz, George M. .....Johnstown, Pa.
Westrick, F. A. .....R. D. 2., Patton, Pa.
Whisler, Edgar .....R. D. 1., Etters, Pa.
White, Arthur H. .....Pulaski, Pa.
Williams, Irwin C. .....Royersford, Pa.
Wister, John C. .....Germantown, Pa.
Witherow, R. T. .....Punxsutawney, Pa.
Wolfe, Charles A. .....Aspers, Pa.
Woods, Edward A. .....Frick Building, Pittsburgh, Pa.
Youngs, L. G. .....North East, Pa.
Minnich & Brother, D. M. .....Chambersburg, Pa.

ANNUAL MEMBERS

Allen, H. G. .....New Park, Pa.
Anthony, R. D. .....State College, Pa.
Arnold, A. F. .....R. D., Beaver Falls, Pa.
Atkinson, R. E. .....Wrightstown, Pa.
Atwater, C. G. .....40 Rector St., New York City
Auchey, Claude .....R. D. 3., Hanover, Pa.
Badesberger, W. P. .....R. D. 2., Bridgeville, Pa.
Baird, A. T. .....Lock Haven, Pa.
Balthaser, James M. .....Wernersville, Pa.
Barnard, C. P. .....Northbrook, Pa.
Benner, B. E. .....Iron Springs, Pa.
Bingham, W. O. .....St. Thomas, Pa.
Baggs, W. H. .....2100 Penn Ave., Pittsburgh, Pa.
Bowers, E. C. .....Elysburg, Pa.
Bedell, G. H. .....309 Telegraph Bldg., Harrisburg, Pa.
Bowker Insecticide Co. .....49 Chamber St., New York City.
Bowman, John H. .....R. D. 3., Lebanon, Pa.
Boyd, Guy H. .....435 Park St., York, Pa.
Brandt, E. W. .....Box 666, York, Pa.
Burgner, M. K. .....Chambersburg, Pa

Butt, J. L. .....Gettysburg, Pa.
Chapin, Irvin .....Shickshinny, Pa.
Cherrington, Ira C. .....Bloomsburg, Pa.
Clemmer, Clarke W. .....Downingtown, Pa.
Clemson, J. W. .....Halifax, Pa.
Cliffe, J. Howard .....Inyland, Pa.
Cope, F. R., Jr. .....Dimock, Pa.
Corson, Walter H. .....Plymouth Meeting, Pa.
Coursen, I. H. .....R. D. 3., Wyoming, Pa.
Cowen, W. H. .....Roaring Springs, Pa.
Creasy, Luther P. .....Catawissa, Pa.
Crossman, L. H. .....Oaks, Pa.
Crowell, Samuel B., ...4420 Osage Ave., Philadelphia, Pa.
Debenham, C. C. .....Jersey Shore, Pa.
Decker, H. B. .....E. Stroudsburg, Pa.
DeCou, Benjamin S. .....R. D. 1., Norristown, Pa.
DeLong, W. D. .....325 N. 9th St., Reading, Pa.
Devlin, Thomas .....Langhorne, Pa.
Dickenshied, F. S. .....Zionsville, Pa.
Dickey, Samuel .....Oxford, Pa.
Doty, H. M. .....Stony Creek Mills, Pa.
Dudley, Howard N. .....Bustleton, Pa.
Duriff, G. M. .....Wellsboro, Pa.
Elder, George K. .....Lewistown, Maine
Ely, Reuben P. .....New Hope, Pa.
Ench, W. K. .....Biglerville, Pa.
Eshelman, S. C. .....McKnightstown, Pa.
Everhart, George W. .....York, Pa.
Fagan, F. N. .....State College, Pa.
Felty, G. B. O. .....Millersville, Pa.
Fenstermacher, P. S. .....Allentown, Pa.
Fetterman, J. Gordon .....Media, Pa.
Flora, Wm. H. .....Wrightsville, Pa.
Friend Manufacturing Co., ...Gasport, N. Y.
From, W. H. .....Sinking Spring, Pa.
Fry, John L., % C. K. Whitner & Co. .....Reading, Pa.
Funk, Sheldon .....Boyertown, Pa.
Garrahan, C. E. .....Kingston, Pa.
Garrahan, F. H. .....A. G. R. House, State College, Pa.
Garretson, Lloyd W. .....R. D. 2, Biglerville, Pa.
Gehr, Harvey J. .....Waynesboro, Pa.
Geigley, Amos .....Orrtanna, Pa.
Geigley, G. W. .....Orrtanna, Pa.
Gideon, George D. .....240 N. 16th St., Philadelphia, Pa.
Goldsboro, E. L. .....Shepherdstown, W. Va.
Goldsboro, H. S. .....Shepherdstown, W. Va.
Graybill, I. G. .....Refton, Pa.
Guyton, Thomas L. .....Dept. of Agriculture, Harrisburg, Pa.
Harnish, James B. .....Sinking Springs, Pa.
Harrison, G. Hale .....Berlin, Md.
Hartman, George R. .....Biglerville, Pa.
Hawkins, E. B. .....Delta, Pa.
Hazlett, J. P. .....Coopersburg, Pa.
Heilman, Albert .....Cleona, Pa.
Heisey, S. A. .....Greencastle, Pa.
Herr, Wesley U. .....Salona, Pa.
Hershey, H. S. .....East Petersburg, Pa.
Hess, Willis A. .....Mt. Alto, Pa.
Hetzel, H. C. .....Hancock, Md.
Haines, Robert B., 3rd.....130 E. Main St., Moorestown, N. J.

Hile, Anthony ..... Curwensville, Pa.
Hochberg, Wm. H. ..... R. D. 1., Verona, Pa.
Hoffman, Ernest M. ..... R. D. 5., Bloomsburg, Pa.
Hoke, Arthur W. ..... Box 322, Cornwall, Pa.
Horst, J. Morris ..... R. D. 3., Lebanon, Pa.
Hudunk, Frank ..... R. D. 2., Norristown, Pa.
Jefferson Cooperage Co. ..... Ranson, W. Va.
Johnson, Edwin ..... Taylorsville, Pa.
Johnson, E. R. ..... Center Ridge, Pa.
Jones, A. J. ..... Dauphin, Pa.
Kauffman, J. B. ..... York, Pa.
Kennedy, Bailey M. ..... Dauphin, Pa.
Kistler, J. M. ..... Stroudsburg, Pa.
Klahre, James E. ..... Riverton, N. J.
Kleppinger, B. M. ..... R. D. 2., Coopersburg, Pa.
Knobel, E. M. ..... Sunbury, Pa.
Koch, C. H. ..... McKeansburg, Pa.
Kruppenbach, Harry ..... Robesonia, Pa.
Kunkel, N. J. ..... Orwigsburg, Pa.
Lau, I. M. ..... Catawissa, Pa.
Leinhart, Edward ..... Lehighton, Pa.
Leonard, F. E. ..... R. D. 1., Carlisle, Pa.
Linde, J. Eric ..... Orefield, Pa.
Livingood, W. W. ..... Robesonia, Pa.
Long, W. W. ..... Eighty Four, Pa.
Longenecker Bros. ..... Palmyra, Pa.
Loose, Erwin W. ..... Menges Mills, Pa.
Lovett, R. P. ..... Fallsington, Pa.
Lute, H. S. ..... Barnesboro, Pa.
Lynn, W. C. ..... Bureau of Markets, Harrisburg, Pa.
Marble, L. M. ..... Canton, Pa.
Martin, J. Warren ..... Orrtanna, Pa.
Mason, A. Freeman ..... Agr. Exp. Station, New Brunswick, N. J.
Melchner, George W. ..... Bally, Pa.
Merkel, Floyd ..... Hamburg, Pa.
Mesta Bros. ..... R. D. 1., Finleyville, Pa.
Meyer, Charles L. ..... 1519 Frick Building, Pittsburgh, Pa.
Meyer, Henry T. ..... Lewisburg, Pa.
Miller, Albert ..... R. D. 3., Lebanon, Pa.
Miller, Amos ..... R. D. 4., Hanover, Pa.
Mills, Elmer S. ..... Camp Hill, Pa.
Minch, Walter L. ..... Bridgeton, N. J.
Minnich, D. N. & Bro. ..... Chambersburg, Pa.
Moon, R. Barclay ..... Morrisville, Pa.
Moore, John W. ..... Norristown, Pa.
Moyer, Samuel ..... Hershey, Pa.
Murphy, S. H. ..... Kennet Square, Pa.
Musselman, Ivan H. ..... Orrtanna, Pa.
Musselman, John ..... Orrtanna, Pa.
Musselman, S. Z. ..... McKnightstown, Pa.
Muth, Harvey W. ..... Allentown, Pa.
Muttart, B. F. ..... Schwenksville, Pa.
Myers, C. E. ..... State College, Pa.
McKenzie, Dr. G. W. ..... 1831 Chestnut St., Philadelphia, Pa.
McNeal, Isaac B. ..... 612 W. 13th St., Tyrone, Pa.
McMullen & Patterson, ... 19 Dundaff St., Carbondale, Pa.
Nicodemus, Ed. ..... Waynesboro, Pa.
Nissley, W. B. ..... State College, Pa.
Patterson, James A. ..... Stewartstown, Pa.
Patterson, W. J. ..... 51 Water St., Pittsburgh, Pa.

Peck, Wm. H. ..... 3rd National Bank, Scranton, Pa.
Pelton, W. R. ..... State College, Pa.
Pentz, Clinton L. ..... R. D. 1., Camp Hill, Pa.
Perkiomen Orchards ..... R. D. 1., Norristown, Pa.
Pershing, Theodore ..... Pineville, Pa.
Pierce, E. F. ..... Box 62 West Grove, Pa.
Pierce, Harry W. ..... Wilkes-Barre, Pa.
Preston, J. Albert ..... Wernersville, Pa.
Raffensberger, Charles E. ..... Arendtsville, Pa.
Randolph, W. C., Jr. ..... Monroe, Va.
Reist, A. S. ..... Palmyra, Pa.
Reiter, G. F. ..... Mars, Pa
Rice, Daniel ..... New Bloomfield, Pa.
Rife, Jacob L. ..... Camp Hill, Pa.
Risser, H. N. ..... Marietta, Pa.
Rittenhouse, Dr. J. S. ..... Lorane, Pa.
Rittenhouse, S. B. ..... Lorane, Pa.
Roberts, Arthur ..... McKnightstown, Pa.
Roberts, Preston F. ..... Moorestown, N. J.
Robertson, William ..... R. D. 2., Oley, Pa.
Rohlfing, F. F. ..... Hummelstown, Pa.
Romig Brothers ..... Downingtown, Pa.
Rowe, O. S. ..... Williamstown, Pa.
Ruhl, Dr. H. F. ..... Manheim, Pa.
Satterthwaite, Lewis P. ..... Newtown, Pa.
Schmidt, John C. ..... Box 666, York, Pa.
Schellenberger, James A. ..... 434 N. 15th St., Allentown, Pa.
Schneber, Harry E. ..... Old Zionsville, Pa.
Shearer, Walter J. ..... Vinemont, Pa.
Sheller, Charles W. ..... West Chester, Pa.
Smith, C. M. ..... Lewistown, Pa.
Smith, Edwin ..... R. F. D. Royersford, Pa.
Smith, E. T. ..... E. Stroudsburg, Pa.
Smith, G. E. ..... R. D. 4., Bethlehem, Pa.
Smith, Leonard R. ..... Dept of Hort., State College, Pa.
Smith, S. A. ..... Yoe, Pa.
Smith, Noah ..... Lewistown, Pa.
Snyder, E. B. ..... Jacks Mt., Pa.
Stark Brothers ..... Louisiana, Mo.
Starkey, S. H. ..... Bustleton, Pa.
Stear, J. R. ..... Chambersburg, Pa.
Stewart, William ..... Landisburg, Pa.
Stitzer, C. E. ..... Millmont, Pa.
Stock, McClean ..... Security Building, York, Pa.
Stolfus, Isaac ..... Ronks, Pa.
Stoner, H. S. ..... Orrtanna, Pa.
Stoner, H. S. ..... Clark's Green, Pa
Stony Ridge Farm ..... Mertztown, Pa.
Strode, A. Darlington ..... West Chester, Pa.
Strode, Marshall ..... West Chester, Pa.
Supiot, A. L. ..... Cornwall, Pa.
Swartz, Samuel L., Jr. ..... Spring Grove, Pa.
Swartz, Samuel ..... Spring Grove, Pa.
Taylor, Porter R. ..... Bureau of Markets, Harrisburg, Pa.
Trostle. F. C. ..... Gardners, Pa.
Uncle Peters Fruit Farms, Inc. ..... Mt. Carmel, Pa.
Vinson, Carl ..... State College, Pa.
Walters, M. T. ..... Biglerville, Pa.
Watts, Gilbert M. ..... Bellewood, Pa.
Watts, R. L. ..... State College, Pa.

Weinschenk, W. H.	New Castle, Pa.
Welshmans, M. O. & Sons	Jersey Shore, Pa.
Wernig, Charles M.	R. D. 2., York, Pa.
Wertz, S. H.	R. D. 2., Reading, Pa.
Whistler, A. K.	Etters, Pa.
White, C. L.	261 S. 3rd St., Philadelphia, Pa.
Willard Parker Co.	Boyertown, Pa.
Wilson, C. C.	R. D. 2., Sharpsburg, Pa.
Walton, R. J.	Hummelstown, Pa.
Wolper, D. L.	Norristown, Pa.
Wrightstone, N. E.	Camp Hill, Pa.
Yoder &Handrich	Orrtanna, Pa.
Rose, Wm. J.	Pomfret Apartment, Carlisle, Pa.
Lewis, W. J.	Pittston, Pa.
Sandusky Cooperage & Lumber Co.	Toledo, Ohio.

CONSTITUTION

Article 1.—**Name and Object.** The name of this organization shall be The State Horticultural Association of Pennsylvania. Its object shall be to foster and encourage the development of horticulture in the State of Pennsylvania.

Article 2.—**Membership.** Any person may become an Annual Member of this Association by paying two dollars ($2.00) to the Secretary, such membership to expire on the first day of the following annual meeting, unless renewed. Any one paying twenty dollars ($20.00) to the Secretary at one time shall be entitled to Life Membership. Persons of distinguished merit in horticulture may be elected to Honorary Membership for the **current year,** by a majority vote of the members present at any regular meeting.

Members of County or local Horticultural Societies shall be granted membership in the State Association under the following conditions:

(1) The County, Local or District Society shall have at least fifteen paid up members, and shall hold at least one meeting a year.

(2) The Secretary of the County, Local or District Society shall remit to the Secretary of the State Association annually one dollar for each member before January 31 of each year which shall be their dues in the State Association for the year.

(3) The Secretary of the County, Local or District Society shall transmit to the Secretary of the State Association annually, at the call of the State Secretary, a list of its officers and members together with a brief report of its work, particularly of those matters that are of general interest to the Horticulturists of the State.

(4) The State Horticultural Association shall publish these Reports in its Proceedings which shall be distributed to the membership of those County, Local or District Societies that have compiled with these provisions.

Article 3.—**Officers.** The officers shall consist of a President, three Vice-Presidents, a Secretary and a Treasurer, all of whom shall be elected by ballot at each annual meeting, to hold office for one year or until their successors shall be chosen, except that the retiring Secretary shall edit the report of the annual meeting at which his successor is elected. No one may serve as President for more than two consecutive terms. These **elective** officers shall constitute an Executive Board in conjunction with an additional indeterminate number of Vice-Presidents whose names shall

be announced by the Secretary at the annual election of officers. These Vice-Presidents shall be the regularly elected Presidents of any County Associations, organized in Pennsylvania for horticultural purposes, whose Constitution is approved by the Executive Board, and whose income from annual membership dues during the preceding year was not less than ten dollars ($10.00). In order to secure admittance to this Board, the Secretary of such County Association shall certify to the Secretary of the State Association that the applicant has been duly elected to serve as their President for the current year and shall also submit a statement showing number of members and amount of dues paid for the preceding year. All officers must be members of the Association in good standing at the time of their election and shall assume their duties at the close of the meeting at which they were elected.

Artice 4.—**Quorum.** Twenty-five (25) members of the Association and five (5) members of the Executive Board shall constitute a quorum for the transaction of business.

Article 5.—**Standing Committees.** The following Standing Committees shall be appointed by the President to serve during his term of office: A Committee on Legislation, to consist of three (3) members; a Committee on Exhibitions, to consist of five (5) members; a Committee on Membership, to consist of one (1) member from each County in the State showing evidence of horticultural activity, and a General Fruit Committee, consisting of one from each County represented, with a general chairman of the whole, each member of the General Fruit Committee to have the privilege of appointing two assistants.

Article 6.—**Annual Meeting.** The Annual Meeting of this Association shall be held during the month of January in each year, at such time and place as the Executive Board shall determine. The regular meetings of the Association shall be closed to all persons, except paid-up members of the Association, speakers, delegates from associations outside of Pennsylvania, all ladies, and the minor sons of members.

Article 7.—**Amendments to the Constitution.** This Constitution may be amended by a two-thirds vote of the members present at any annual meeting, provided such amendment shall have been presented to the Secretary in writing at least sixty (60) days prior to time of holding the annual meeting, and by him referred to all members in connection with the announcement of said meeting.

BY-LAWS

Article 1.—**Duties of the President.** The President shall be the executive officer of the Association and of the Executive Board, and shall preside at all meetings of either body designating one of the Vice-Presidents to serve in his stead when necessarily absent. He shall pass upon all bills and accounts of the Association before they are ordered paid by the Secretary; he shall appoint all delegates to other associations and all special and standing committees of the Association unless otherwise ordered.

Article 2.—**Duties of Vice-Presidents.** The Vice-Presidents shall serve on the Executive Board and any one of them may be called upon by the President or the Executive Board to assume the duties of the Chair at any meeting. They shall also actively represent the Association in its various lines of work in their respective counties.

Article 3.—**Duties of the Secretary.** The Secretary shall be the recording, corresponding, and accounting officer of the Association and of the Executive Board; he shall incur no expenditure of a large or doubtful character without the sanction of the Business Committee; he shall secure the written approval of the President on all bills or claims against the Association before drawing his order on the Treasurer for the payment thereof; he shall attend all meetings of the Association and of the Executive Board and shall keep a faithful record of their proceedings; he shall sign all certificates of membership and all Diplomas and Certificates of Merit, awarded by the Association. All money received by him shall be promptly paid to the Treasurer. He shall have charge of the Association's books and papers and shall be responsible to the Board for all property placed in his charge; he shall be the custodian of the Seal of the Association, and shall have authority to affix same to documents when needful; he shall seek by all suitable means to secure the fullest announcement of the meetings of the Association in this State, as well as in adjacent States, when such shall be found desirable. It shall also be his duty, yearly, to prepare for publication, the Annual Report of the Association, together with such other matter as he shall deem proper, he being aided in the selection of such matter by an advisory committee of the Executive Board. As recompense, the Secretary shall receive all necessary expenses, and such salary as may be determined by the Executive Board.

Article 4.—**Duties of the Treasurer.** All the funds of the Association shall be paid into the hands of the Treasurer; he shall disburse the moneys of the Association that shall come into his hands only upon order of the Secretary,

countersigned by the President; he shall keep the moneys received by the Association for Life Memberships as a distinct fund, and shall invest the same under the advice and direction of the Executive Board, applying only the interest accruing thereon to the purpose of the general fund. Immediately upon assuming his office and before entering upon his duties, he shall execute to the Association an official bond with sufficient securities conditioned for the safe-keeping and disbursement of the moneys of the Association, and for the proper discharge of the further duties of his office, in such sum as shall be specified by the Executive Board, the premium on which shall be paid by the Association. This bond shall receive the approval of the President, and shall be deposited with the Secretary. Immediately preceding the annual meeting, he shall submit to the Executive Board a written report showing the amount of money that shall have come into his hands during the year, the sources from which it has been derived, and the disposition made of the same. This statement shall be published in the Annual Report of the Associatoin.

Article 5.—**Duties of the Executive Board.** The Executive Board shall enact all rules and regulations for the management of the affairs of the Association, determine the salaries of its officers, and assume the control and management of its exhibitions; it shall have power to displace any officer of the Association for neglect of duty or abuse of position; shall fill all vacancies by appointment to continue until the next annual election; and shall hold at least two (2) regular sessions during the year, one of which shall occur at the time and place of the Annual Meeting of the Association. It may hold other meetings when called by the Secretary under the advice or direction of majority of the members of the Board at such times and places as may be deemed most convenient, but in all such cases, each member must be duly notified of the time, place, and object of such meeting; it shall carefully guard the interests of the Association, watch over its finances and provide for its necessities as they shall arise; it shall appoint from its own number three members, who shall constitute a Business Committee for the year, and upon which the Secretary and Treasurer may not serve; and it shall submit to the Annual Meeting, through the Secretary, such report upon the condition, general interests, and prospects of the Association as it shall judge necessary or expedient. All important measures shall be submitted to this Board, but may, by the Board, be resubmitted to the Association for recommendations.

Article 6.—**Duties of the Business Committee.** It shall be the duty of the Business Committee, upon application of

the Secretary, during the recess of the Executive Board. to advise with him as to the expediency of making any contemplated but questionable expenditure for which occasion may arise during such recess. The Business Committee shall also audit the accounts of the Secretary and the Treasurer just prior to the annual meeting and submit written report of its findings to the Executive Board.

Article 7.—**Duties of the Standing Committees.** (1) The Committee on Legislation shall inform itself in regard to such existing laws as relate to the horticultural interests of the State and bring the same to the attention of the Association, at the same time reporting any additional legislation which in their judgment is desirable; when so directed by the Association, it shall cause to be introduced into the State Legislature such bills as may be deemed necessary and shall aid or oppose any bills introduced by others which directly or indirectly affect the interests of the fruit grower.

(2) The Committee on Exhibitions shall suggest from time to time such methods and improvements as may seem to them desirable in conducting the exhibitions of the Association, as well as otoher fruit exhibitions throughout the State, and with the assistance of the Executive Board, shall arrange the premium lists, and have charge of all the exhibitions of the Association.

(3) The Committee on Membership and Expansion, with the co-operation of the County Vice-Presidents, shall bring the work of the Association to the attention of fruit growers throughout the State, and by such means as they deem best, strive to increase the membership.

(4) The General Fruit Committee shall carefully and thoroughly investigate the subject of fruit culture in general. Each local committee of three shall collect such useful and interesting information in relation to the subject as may be in their power, and embody the same in monthly reports, to be made to the general chairman; such reports to be by him examined and embodied in his annual and semi-annual reports.

Such other standing Committees may be created by the Executive Board from time to time, as in its discretion may seem desirable or necessary.

All standing committees shall report to the Annual Meeting in January, any information of value to the Association or its members, that may have come to their knowledge during the year, as well as anw scientific theories, deductions or facts that in their opinion may be useful in advancing the object for which the Association is laboring.

Article 8.—**Nomenclature.** The Association shall adopt the nomenclature of the American Pomological Society.

Article 9.—**Amendments to By-Laws.** Amendments or additions to these By-Laws may be made by a majority vote of the Executive Board at any meeting, but if objection shall be made, the same shall "lie upon the table" till the next regular meeting of the Board. These By-Laws, or any one or more of them, may be suspended for the time, by order of a majority of all the members of the Association present and voting. A proposition in the general meeting of the Association for an amendment or addition to these By-Laws shall be referred to the Executive Board for consideration and decision, but the Association may submit therewith its advice or request.

HARRISBURG, PA.

Chestnut Street Auditorium.

Wednesday Morning, January 25, 1922.

THE PRESIDENT'S ADDRESS

By P. S. Fenstermacher, Allentown, Pa.

Ladies and Gentlemen, and Members of the State Horticultural Association of Pennsylvania:

We are glad to welcome you to this the sixty-third annual meeting of the Association.

In opening we cannot refrain from contrasting the situation during 1921 with conditions of 1920, the year of plenty and low prices. Not within the memory of any one living today has the contrast been so great. I doubt whether such an almost total failure of the fruit crop was ever experienced in Pennsylvania. Of the apples, only the late blooming varieties matured fruit worth mentioning, viz., Jonathan, King David, Senator, Rome Beauty, etc., while the old standbys like the Baldwin, Greening, entire Winesap family and others of the early blooming varieties were a failure. To my mind this failure was not to be attributed to a question of variety, but was simply caused by a freak of nature bringing on a too early prolonged high temperature which started all plant life two to three weeks ahead of the usual time, and then hit by a frost, which we usually have about this time, but which upon this occasion found vegetation at the stage when it is most susceptible to frost injury. Curious as it may seem, the peach which is supposedly less hardy, and of which we usually have reports of frost injury more or less exaggerated, had with us advanced beyond this most tender stage, and matured as good and profitable a crop as we ever harvested. This, however, was exceptional, for generally over the state it was practically a failure. To our surprise even the hardy Red Clover

succumbed, while the alfalfa, survived and produced from three to four cuttings during the season.

The old adage that it is an ill wind that does not blow somebody some good, certainly is applicable to the Northwestern apple growers, for with the slight exception of parts of New York, the eastern states and Canada, they had the markets entirely to themselves; but with an unusually light foreign demand for apples, they have been obliged to force their products into every nook and corner of the land. The wholesale box prices are not exorbitant, considering the high freight rate, orchard and selling expenses, but our old enemy the retailer has been reaping a harvest by charging the consumer as high as 10 cents apiece, and even in one instance asking 50 cents for three apples. At $2.25 to $3.00 per box, the prevailing wholesale prices in the East, the Western growers did not have more than a reasonable margin of profit, considering all the circumstances.

Pondering over this very peculiar situation, the query naturually arises, what would have happened had the middle west and east produced its usual quota of fruit? With the very light foreign demand, to what extent would the northwestern apples have interfered with the sale of our crop in our own markets? Could any of them, either north and middle west, or the east, have disposed of their products at the cost of production? In our unorganized condition, what chance do we have to realize our expectations? Is it not of the utmost importance that we of Pennsylvania prepare ourselves to meet the competition of the products of the highly organized northwestern growers? The day is not far distant when we will have to face this situation. It is true that the condition of some of us is different in that we are fortunate in having nearby markets where we can reasonably expect to dispose of our fruit at renumerative prices, but what will be the condition of those growers who are less fortunately situated, so that they are obliged to ship, and whose products will be at the mercy of the railroads and the coommission men? How long can any of us expect to maintain prices under such conditions?

It must be evident to every grower that it is high time that we begin to put into action the talks and thoughts we have been considering for better grading and packing, and a more efficient distributing organization. Do not be lulled into contentment by these talks of Pennsylvania's many nearby markets to be reached by many miles of good roads, and its more numerous cities of from 5 to 10 thousand population, more than those of any other state in the union; All of these will also be accessible to the distant growers, unless our products are placed upon the markets so that they make just as good an appearance, and our sales will suffer, notwithstanding

succumbed, while the alfalfa, survived and produced from three to four cuttings during the season.

The old adage that it is an ill wind that does not blow somebody some good, certainly is applicable to the Northwestern apple growers, for with the slight exception of parts of New York, the eastern states and Canada, they had the markets entirely to themselves; but with an unusually light foreign demand for apples, they have been obliged to force their products into every nook and corner of the land. The wholesale box prices are not exorbitant, considering the high freight rate, orchard and selling expenses, but our old enemy the retailer has been reaping a harvest by charging the consumer as high as 10 cents apiece, and even in one instance asking 50 cents for three apples. At $2.25 to $3.00 per box, the prevailing wholesale prices in the East, the Western growers did not have more than a reasonable margin of profit, considering all the circumstances.

Pondering over this very peculiar situation, the query naturually arises, what would have happened had the middle west and east produced its usual quota of fruit? With the very light foreign demand, to what extent would the northwestern apples have interfered with the sale of our crop in our own markets? Could any of them, either north and middle west, or the east, have disposed of their products at the cost of production? In our unorganized condition, what chance do we have to realize our expectations? Is it not of the utmost importance that we of Pennsylvania prepare ourselves to meet the competition of the products of the highly organized northwestern growers? The day is not far distant when we will have to face this situation. It is true that the condition of some of us is different in that we are fortunate in having nearby markets where we can reasonably expect to dispose of our fruit at renumerative prices, but what will be the condition of those growers who are less fortunately situated, so that they are obliged to ship, and whose products will be at the mercy of the railroads and the coommission men? How long can any of us expect to maintain prices under such conditions?

It must be evident to every grower that it is high time that we begin to put into action the talks and thoughts we have been considering for better grading and packing, and a more efficient distributing organization. Do not be lulled into contentment by these talks of Pennsylvania's many nearby markets to be reached by many miles of good roads, and its more numerous cities of from 5 to 10 thousand population, more than those of any other state in the union: All of these will also be accessible to the distant growers, unless our products are placed upon the markets so that they make just as good an appearance, and our sales will suffer, notwithstanding

the superior flavor of our fruit. The logical conclusion of all this, for self preservation, must be the thorough organization by the growers of every community for **better grown fruit,** more **uniform grading,** and **honest packing,** in an **attractive package.**

I wish right here to quote from a New York paper, as follows:

NEW YORK APPLES DEAD

Demand for Barreled Apples at Rochester is Nil.

Heavy Reserve of Western Box Fruit Kills Market

"Rochester, Jan. 20.—It needs a detective to discover any apple market here; it appears to have eluded about every one who has anything to sell and the most substantial thing just now is rumor of what will be. It can be explained that Baldwins A grade, 2½ in. and up, and nearer fancy than A grade are worth $7 @ 7.25 bbl., f. o. b. Ordinary A grade, are held at $6.50 @ 6.75 bbl., with an occasional sale but the Rochester offices of the Federal Bureau of Markets, frankly admits that the sales are too few to establish any dependable market. Baldwins, A grade, 2¼ in. and up, held at $6 @ 6.25 mostly, with occasional lots offered as low as $5.75. These showed little color.

"All in all, the markets is at a standstill. Owners of really good lots have no notion of dumping on the present market, but believe that there will be less competition a month hence or possibly waiting until March if demand does not speed up before. Under the conditions, there are some lots moving on consignment, but a good part of this is ordinary quality.

"There is the economic stringency with thousands of potential apple eaters without money to buy any but the prime necessities of life, and there is the heavy reserves of Western box apples. If these reserves were out of the way, and barreled apples must supply the demand largely from now to the end of the season, it is a good guess that there would be some speculative buying barreled stock. Some of those who are determined to stay bullish to the end point to the drop in onions and celery and then the sharp reaction as a sample of what can happen sometimes."

Community packing houses should be placed conveniently for loading and distributing, and far enough apart to bring enough fruit, to maintain sufficient experienced help. The head of the concern should be a man of ability and experience, and well versed on the conditions of the markets of the country. The present high freight rates will not be a barrier protecting the eastern grower much longer. Superior organization with

resulting efficiency will win the day regardless of where the orchards are situated. We are growing specialized crops, and we must use specialized methods to dispose of them.

The answer to the query, why the farmer does not advertise, is the same as to why he does not standardize and why he does not provide himself with a proper system of distribution. **It is because he does not organize.** Organization being the only key to the situation, it is a question of time only until the fittest alone can survive.

Repeated references are being made by nursery men and periodicals to the less number of fruit trees in certain sections of the country, as compared with ten or more years ago. But they all fail to explain that the fruit trees now planted, and which will soon be fruiting heavily, are in the hands of commercial orchardists who are giving these trees the best of care, with the result that the yield will more than make up the deficiency of trees as compared with the greater number of trees which received little or no attention from farmers. The prevailing high prices and the seductive nurserymen's catalog will undoubtedly stimulate the uninformed, and others having more money than practical experience, to rush into orcharding; and consequently many new plantings will be made until the next bumper crop reduces their temperature to normal.

The summer trip of the Association, which extended through parts of Berks, Lehigh, Luzerne and Wyoming Counties, was not well attended. Those that ventured over the hills and valleys with their beautiful scenery, and numerous well kept orchards and market gardens, were well repaid for the effort. The glad hand of welcome was freely extended, and the lavish entertainment and concern for our welfare were enjoyed and highly appreciated.

While I have no intention of infringing upon the report of the Secretary, I again bring to the attention of the association the necessity of more persistent efforts to increase the membership, so that the association will be in position financially to render better service to its members, and so that information can be disseminated that will soon become of such vital importance to the fruit and vegetable growers.

No person engaged in this business can afford to be without the Annual Report. This in itself is worth fifty times the price of the annual dues. Certainly no one attending these meetings, and listening to the instructive lectures delivered by these eminent speakers can leave the room and not have his conscience remind that he owes it to the Association and to himself, that he become a member now, and thereby contribute his share to defray the expenses of this meeting, and the printing of the Annual Report. I hope the membership committee will quicken the conscience of all "back sliders" and others, so that everyone in attendance at these meetings

the superior flavor of our fruit. The logical conclusion of all this, for self preservation, must be the thorough organization by the growers of every community for **better grown fruit,** more **uniform grading,** and **honest packing,** in an **attractive package.**

I wish right here to quote from a New York paper, as follows:

NEW YORK APPLES DEAD

Demand for Barreled Apples at Rochester is Nil. Heavy Reserve of Western Box Fruit Kills Market

"Rochester, Jan. 20.—It needs a detective to discover any apple market here; it appears to have eluded about every one who has anything to sell and the most substantial thing just now is rumor of what will be. It can be explained that Baldwins A grade, 2½ in. and up, and nearer fancy than A grade are worth $7 @ 7.25 bbl., f. o. b. Ordinary A grade, are held at $6.50 @ 6.75 bbl., with an occasional sale but the Rochester offices of the Federal Bureau of Markets, frankly admits that the sales are too few to establish any dependable market. Baldwins, A grade, 2¼ in. and up, held at $6 @ 6.25 mostly, with occasional lots offered as low as $5.75. These showed little color.

"All in all, the markets is at a standstill. Owners of really good lots have no notion of dumping on the present market, but believe that there will be less competition a month hence or possibly waiting until March if demand does not speed up before. Under the conditions, there are some lots moving on consignment, but a good part of this is ordinary quality.

"There is the economic stringency with thousands of potential apple eaters without money to buy any but the prime necessities of life, and there is the heavy reserves of Western box apples. If these reserves were out of the way, and barreled apples must supply the demand largely from now to the end of the season, it is a good guess that there would be some speculative buying barreled stock. Some of those who are determined to stay bullish to the end point to the drop in onions and celery and then the sharp reaction as a sample of what can happen sometimes."

Community packing houses should be placed conveniently for loading and distributing, and far enough apart to bring enough fruit, to maintain sufficient experienced help. The head of the concern should be a man of ability and experience, and well versed on the conditions of the markets of the country. The present high freight rates will not be a barrier protecting the eastern grower much longer. Superior organization with

resulting efficiency will win the day regardless of where the orchards are situated. We are growing specialized crops, and we must use specialized methods to dispose of them.

The answer to the query, why the farmer does not advertise, is the same as to why he does not standardize and why he does not provide himself with a proper system of distribution. **It is because he does not organize.** Organization being the only key to the situation, it is a question of time only until the fittest alone can survive.

Repeated references are being made by nursery men and periodicals to the less number of fruit trees in certain sections of the country, as compared with ten or more years ago. But they all fail to explain that the fruit trees now planted, and which will soon be fruiting heavily, are in the hands of commercial orchardists who are giving these trees the best of care, with the result that the yield will more than make up the deficiency of trees as compared with the greater number of trees which received little or no attention from farmers. The prevailing high prices and the seductive nurserymen's catalog will undoubtedly stimulate the uninformed, and others having more money than practical experience, to rush into orcharding; and consequently many new plantings will be made until the next bumper crop reduces their temperature to normal.

The summer trip of the Association, which extended through parts of Berks, Lehigh, Luzerne and Wyoming Counties, was not well attended. Those that ventured over the hills and valleys with their beautiful scenery, and numerous well kept orchards and market gardens, were well repaid for the effort. The glad hand of welcome was freely extended, and the lavish entertainment and concern for our welfare were enjoyed and highly appreciated.

While I have no intention of infringing upon the report of the Secretary, I again bring to the attention of the association the necessity of more persistent efforts to increase the membership, so that the association will be in position financially to render better service to its members, and so that information can be disseminated that will soon become of such vital importance to the fruit and vegetable growers.

No person engaged in this business can afford to be without the Annual Report. This in itself is worth fifty times the price of the annual dues. Certainly no one attending these meetings, and listening to the instructive lectures delivered by these eminent speakers can leave the room and not have his conscience remind that he owes it to the Association and to himself, that he become a member now, and thereby contribute his share to defray the expenses of this meeting, and the printing of the Annual Report. I hope the membership committee will quicken the conscience of all "back sliders" and others, so that everyone in attendance at these meetings

will be properly decorated with the button, which is the official, visible sign of a membership, and admits to all the sessions. We trust you will all take part in the discussions; be free to ask questions; make yourself at home; and above all feel that you are one of us-MAKE THIS YOURMEETING.

I now wish to call on Mr. Carl G. Vinson of State College for a "Report of the 1921 Summer Trip."

SUMMER TRIP OF HORTICULTURAL SOCIETY

August 9 to August 11, 1921

Nine cars assembled at the Peerless Orchards of the American Fruit Growers' Inc., near Hamburg, Pennsylvania, at ten A. M. August 9th. Following a trip through the orchards, Carmen peaches were served to the crowd after which the trip continued to Allentown where dinner was obtained.

Thirty cars assembled at the Court House in Allentown about one P. M. The trip in Lehigh County was under the direction of Mr. A. L. Hacker, County Agent. The first stop was at the farm of Mr. G. E. Smith. Mr. Smith gave an interesting talk. Here he was growing twelve strains of Danish Cabbage from twelve sources of seed; fifteen acres of Danish Cabbage for winter cabbage; seven acres of Danish Cabbage were being grown with the city garbage as fertilizer.

The second stop in Lehigh County was at Schantz's City View Orchard of approximately one hundred acres with a planting of 2,000 apple, 4,000 peach, 300 pear, and 200 cherry. Mr. Harold Schantz gave a talk on the home storage. He expressed the opinion that it was more desirable to store in ventilated crates than in closed packages. Stayman and Wealthy at the City View Orchard were pretty well loaded, also Early Crawford peach trees. The last visit in Lehigh County was at the extensive holdings of the Hon. Harry C. Trexler. Here 550 acres are in orchard; 10,000 apples and 15,000 peaches. A young bearing orchard of Rome and Wealthy under the alfalfa mulching system was visited. These trees were carrying a fair load of fruit. One large peach orchard of Salway and Elberta was visited. The Elbertas were carrying a moderate crop, and clean cultivation was practiced here. A visit was made to the packing house, which is equipped with a peach and apple grader. By means of a special truck Mr. Lindy hauls seventy sixteen quart peach baskets per load. Jefferis, Red June and Gravenstein apples were being harvested. Large well grown Hiley peaches were served to all. After visiting the orchards the party was conducted over sandy roads through the extensive game preserves. Gaining a high point, the party halted. Here one could see

for miles; a herd of many buffalos with several calves was nearby. On another hillside a herd of twenty elk could be seen.

The morning of August 10th was spent visiting the trucking sections adjacent to Wilkes-Barre. Mr. Pierce related a bit of his experience in setting out celery plants. He stated that celery plants dug and puddled on Saturday, held and set on Tuesday, did much better than plants lifted and planted the same day; since the small roots had a chance to get started previous to planting. The Garrahan Brothers had many acres of tomatoes, also celery and cabbage.

In the afternoon of August 10th visit was made to the orchards of W. J. Lewis. One peach orchard represented a planting of about eighty acres and contained Arp Beauty, Champion and Elberta. These trees had been cut back in 1920 and then were so pruned that fruit was secured far down on the main branches on the interior of the tree. Mr. Lewis had a good peach crop but very few or no fruit on the Hiley trees. A visit was also made to the common storage house of Mr. Lewis. The capacity of this storage is 16,000 bushels.

From this orchard the trip led to the orchards of Mr. Giles Gay and Mr. Schoonover. Mr. Gay had some Baldwin and Rhode Island trees, 30 years old, that have made remarkable growth and have been very productive. Mr. Schoonover planted prunes as a filler in a young apple orchard and stated this was proving satisfactory.

August 11th was spent in visiting the orchards of Wyoming County. The first visit was to the orchard of Mr. F. H. Fasset. Here some old Northern Spy trees were seen that were carrying a good crop. They showed the results, in growth and production, of good soil combined with good care. The orchard of Mr. Clarence Triebel was carrying a fair load of fruit, especially young Wagner and Rome Beauty.

In the afternoon of August 11 visits were made to the Chandler orchards and the fruit farm of Mr. Alvin DeWitt. At the Chandler farm Belle of Georgia and Carmen were carrying a good crop of excellent fruit. An excellent cover crop of buckwheat was growing in the young orchard here. Both peach and apple trees on the Chandler farm showed the results of good pruning.

It was the consensus of opinion by those on the trip that it was most valuable where the orchards were gone into, questions asked, and the growers problems asked.

CONTROLLING PEACH BORERS WITH PARADICHLOROBENZENE

By H. E. Hodgkiss, State College, Pa.

There is probably no insect control practice which has attracted as much interest among orchardists as the new method of destroying borers in peach trees. Aside from being a laborious and expensive task the old method of working is always attended with possible injuries to the trees, and it is not impossible that the practice may be a causal agent in the spread of diseases such as peach yellows or crown gall.

The subject will be considered under the following captions:

1. General discussion
2. Effects of Paradichlorobenzene on trees and insects
3. Extension activities

General Discussion

Description of Material.—Paradichlorobenzene is a crystaline product, insoluble in water. It vaporizes at ordinary temperatures. The gas given off is heavier than air and penetrates the soil working into the burrows where it destroys the insects. Paradichlorobenzene is not poisonous to man although very toxic to insects. Some injury to roots and tissues of most plants has been observed but the thick bark of older peach trees seems to protect the tender growth and prevents the gas from attacking it.

Name for the Material.—There seems to be a demand among fruit growers for a shorter common name for the material. There are several trade names by which it is known, none of which perhaps are suitable for our purpose. A suggestion by the New Jersey Experiment Station that the abbreviation P-C-Benzene be used for the purpose seems to meet with general approval, and that term will be used in this article as a substitute for the longer name.

Method of Application.— (1) Remove all weeds or large stones from around the tree. Scrape all gum from the trunk above the ground. If necessary mound the soil to a point where the gum has been removed, and level the surface for a width of six or eight inches from the trunk.

(2) Place a ring of P-C-Benzene on the soil in a ring two inches from the trunk, being careful not to get the material closer to it than one inch.

(3) Cover with soil to a depth of four to six inches over the chemical, tamping it down so as to form a cone-shaped mound.

Effects of Paradichlorobenzene on Trees and Insects

Dosage.—A number of tests were made during the past season to ascertain the amounts of material necessary to secure suitable killing of borers under the several soil conditions in Pennsylvania. One-half ounce, three-fourths ounce and ounce applications were made to trees six years and older. Trees two to five years old were treated with either three-fourths ounce or one-half ounce dosages.

In these experiments on the older trees both of the larger amounts were equally effective under comparable soil conditions, but the one-half ounce of material was not as effective in some orchards which bears out the tests made in other peach growing areas. Where small trees were treated with the least amounts the killing was equally good but in the case of very small stocks one-half ounce appeared to be a sufficient quantity for the killing of the worms.

Period for Killing.—Trees six years of age and older were subjected to treatments of from seven to forty days duration using three-fourths ounce to one ounce of the material, depending on the amount necessary to circle the tree. Exposures of seven to ten days were lacking in killing properties, although when the material was allowed to remain undisturbed for fourteen days there was only an occasional borer removed which did not show the effects of gassing. After three weeks exposure to the fumes as many as ten or fifteen large, dead borers were removed from a single tree.

Distance of Material from Tree.—In all our tests the P-C-Benzene was placed either one or two inches from the tree and sprinkled about an inch wide in the ring. The rate of killing was equally good irrespective of which plan was followed on soils of the same texture and moisture content. It was not necessary to experiment with the chemical placed at greater distances since the New Jersey Experiment Station and the Federal Bureau of Entomology have shown that when material was placed four to six inches from the tree it was ineffective.

Time of Application.—Trees were treated at weekly intervals from July until September and from then until October 18, 1921. The tests made previous to September invariably showed three or four live borers of various sizes unharmed by the treatment. All the plots treated between September 8 and October 15, 1921, were uniformly free from live borers when examined during October and November. Two later applications gave poor results largely on account of low soil temperatures prevalent during that period. As a result of these observations we suggest that the best time to apply the material in the more northern peach areas is from September 10 to September 30. In those counties having a longer

growing season the period may be extended to October 15 if it is not possible to complete the work before that date.

Effects on Trees.—In all our work there is no indication of injury to trees six years and older or even on those four or five years of age. Some treatments have been made to cherry, plum and quince trees of the same age, using the material in the usual proportions. No injurious effects were noted on these trees when they were examined in October. It is desirable, however, to watch these blocks another season before drawing conclusions as to the desirability of using P-C-Benzene on such trees for borer control. Younger peach trees were apparently uninjured by short exposures to the gas, but owing to the unsafeness of the gas on tender plant tissues it seems best not to treat small trees until further experience proves the safeness of the practice.

Soil Types in Relation to Gas Diffusion

Some interesting observations have been made in respect to the vaporization of P-C-Benzene in various types of soil. Ground of a gravelly nature or of sand allowed under normal conditions of temperature and moisture the complete volitization of the crystals. Clay soils did not allow the gas to diffuse readily, while in shale ground there was usually some material at the end of a four or six week period. Despite these differences in volitilization of the crystals there were few differences in the effectiveness of the material on the borers.

Cost of Treatment

The cost of operations is a large factor in the control with P-C-Benzene. Of a number of cost records five have been selected which represent the several larger peach growing areas. These vary somewhat depending largely on the soil conditions. The costs given by the orchardists for their plantings are from 3½ cents to 5 cents per tree. To worm these same trees the average cost based on previous annual expense was about twenty cents per tree.

Extension Activities During 1921

The College of Agriculture through its extension activities has aimed to carry to peach growers the information it has accumulated and to give them original help in the practice of applying the P-C-Benzene treatment to peaches. Our work has been accomplished in twenty of the peach growing counties in which there were forty-two demonstrations staged. At these meetings five hundred orchardists applied the material under our supervision and many other farmers who were in attendance were informed as to the advisailbity of the practice in situations where only a few trees were involved. As a result of our activities there were about seventy thousand trees fumigated for borers in these counties. It is

planned to continue these operations during 1922 and it is hoped we can extend our work to include at least most of the commercial peach growing areas in the state.

Suggestions for Next Year's Work

In view of the varying conditions under which peaches are grown in Pennsylvania, it appears as if the P-C-Benzene should be applied as early in the fall as opportunity permits and yet late enough to secure the greatest killing of borers. In general, work can be started by September 10 and in the more elevated areas completed by September 30. Treatments applied as late as October 15 in the more southern counties will be efficient and most of the crystals will be volatilized before the soil temperatures become too low for effective work. Peach trees six years of age and older can be fumigated with little danger from the gas. Younger trees except those one to three years may be treated for three weeks with small fear of damage provided the soil is removed at the end of that period. Younger trees should be wormed by hand.

Mr. Jones: How much paradichlorobenzene did you use to trees two or three years old?

Prof. Hodgkiss: About one-half ounce, although I might say that it is inadvisable to use P-C-Benzene on trees that are young because there is a tendency for the gas to injure the bark on the younger trees. I do not suggest treatment of trees younger than six years of age, although thousands of trees treated in the state this year were four or five years old. Another year we will have more information on that point.

Mr. Griest: We have a great many peach trees to get over. We experimented last fall with excellent results, and if we can get over a couple of thousand more in the spring, we will be in pretty good shape. Do you think we can do that?

Prof. Hodgkiss: For best results you should treat them in the fall, but if you have others to treat in the spring I would go ahead and do it.

Member: At what time in the spring can you do it?

Prof. Hodgkiss: Just as soon as the soil reaches a temperature of about 55 deg., when the soil is dry enough to work.

Mr. Knight: I would like to ask whether these experiments have been tried on apple trees to kill the apple tree borer?

Prof. Hodgkiss: You have an entirely different proposition with the apple tree borer. Tests have been made to find out the effect of this material on apple trees, and it seems to be rather injurious to them. In Carbon County trees treated

with the material (cherries and quinces as well as peaches) this fall showed no injury to cherries or quinces. We will know more about it next year.

Member: Have you worked out any convenient scheme for measuring one-half ounce and one-fourth ounce for each tree?

Prof Hodgkiss: Secure a pill box, or small bottle that will hold just about one ounce of the material by weight, and use about half that amount. Then spread it around, or you can just spread it direct from the bottle.

Mr. Adams: Will it lose strength standing?

Prof. Hodgkiss: It will gradually volatilize. It should be kept in as tight a container as possible. As long as it is kept in a proper place the volatilization will be small.

Member: What are the results of putting the material too close to the tree?

Prof. Hodgkiss: The symptoms are a browning or spotting of the bark or cambium, which is due to the action of the gas, and if you have too much close to the tree, it will kill the tree.

Member: What distance should it be placed from the tree?

Prof. Hodgkiss: It is safest to keep it two inches away from the tree. It is not necessary to use particular care in sprinkling it around, only be sure not to get too near the tree. Do not pile it up because then it will not volatilize quickly enough.

Member: Are plums as free from injury from the material as peach?

Prof. Hodgkiss: I think you can safely put it around plum trees, although at the present time we are only advising it on peach. I would rather not use it on plums or other fruits until we get more data upon it.

Mr. Dromy: We used paradichlorobenzene on peach, and found that three weeks after application it had not volatilized. The trees were three years old.

Prof. Hodgkiss: Leave it on from four to six weeks. You put it on trees too young to be treated.

Mr. Heisey: Are you safe in using it on four and five year old trees, leaving it on for fourteen days?

Prof. Hodgkiss: Last year we treated about 30,000 five-year-old trees, and the State of New Jersey treated four or five -year-old trees successfully. I think it is perfectly safe under our conditions.

Mr. Bowers: We used it on about 1,200 trees, and the only objection was the name, as we could see it. Since that has been simplified to P. C. Benzene that helps us out of our problem. We could not get the boys to pronounce it. They simply called it "bug killer." We used the material with

good success. We did not kill all the borers for in taking the mound away to apply the P. C. Benzene and then mounding the earth again we did not get it as high as before, and, of course, any that were above won't be affected. We had borers above the gas line, but everything below was killed.

Prof. Hodgkiss: Where you have your mound so high, put a layer of the material on a level with the ground, and then another ring on top of the mound.

Member: When did you treat your trees?

Mr. Bower: The last part of September, and the beginning of October.

Mr. Fenstermacher: Is there any danger to eight-year-old trees about that time, if the material has not been removed?

Prof. Hodgkiss: I do not think so.

Professor J. G. Sanders, Director, Bureau of Plant Industry, Harrisburg, Pa., read the following paper for Mr. T. L. Guyton, who was called away from the meeting:

THE CONTROL OF THE PEACH TREE BORER WITH PARADICHLOROBENZENE

By Thomas L. Guyton, Pennsylvania Dept. of Agriculture, Bureau of Plant Industry.

Throughout the paper the writer has used the abbreviation P D B for the cumbersome scientific name of the salt, paradichlorobenzene, and it is hoped that for the sake of brevity and ease of pronunciation that P D B be generally adopted.

What is P D B ? P D B is a white crystalline solid, insoluble in water and somewhat like coarse epsom salts in appearance. At temperatures above 55 degrees F. it changes into a gas which is heavier than air. This gas under ordinary conditions is not injurious to man, but in high concentrations is deadly to insects.

History of Development. P D B is a quite recent development in peach tree borer control. The first experiment with the material as an insecticide against the peach tree borer was started in 1916, by the Federal Bureau of Entomology. The results of the experiments were published in 1919 as Bulletin 796 of the U. S. D. A. In this Bulletin it is recommended that P D B be used at the rate of 1 ounce per tree on trees 6 years old or older. On trees of this age the percent of control is given at approximately 94 percent. Since this publication further experimentation has been done at the New Jersey Experiment Station, particularly along the lines of amount of material necessary for effective kill, length of time of exposure necessary, and safe and effective treatments for trees under 6 years of age.

The Peach Tree Borer (Aegeria exitiosa Say)

Before discussing P D B in peach tree borer control it will serve our purpose to consider briefly the peach tree borer itself, its life history and injury to peach trees.

Description. The borer is a white or light yellow worm with a dark brown head. It reaches a length of about 1 inch when fully grown. After reaching maturity the larva forms an elongate brown cell of wood particles within which it changes into the winged adult. The adults are wasp-like in appearance. They are dark shining blue in color. The female is more robust than the male and has a broad orange colored band on the abdomen. The male is slender bodied and usually has several narrow yellow bands on the abdomen.

Life History. The earliest adults emerge about the middle of June in Southern Pennsylvania, two weeks later in Northern Pennsylvania, and from then until about the 15th of September adults continue to emerge, though few appear after September 1st. They live for only a few days after emerging, but during this time the female lays several hundred eggs. The eggs hatch in 9 - 10 days, and shortly afterwards the young larvae burrow into the bark. The greater portion of the life cycle of the borer occurs in burrows under the bark of the tree, the larva feeding until winter, remaining quiet over winter and feeding in the spring until pupation occurs in late spring or summer.

Injury. The peach tree borer injures the peach tree by burrowing into and under the bark at the base of the tree. usually below the surface of the ground. The presence of borers in the tree is indicated by the exudation of masses of gum mixed with sawdust-like castings. In many cases trees are so badly attacked by borers that they are girdled and killed.

Method of Applying P D B. Before applying P D B a space about a foot wide all around the tree should be cleared of grass, stones, debris, etc.. using care to disturb the soil as little as possible. A long handled round pointed shovel is a very good tool for this work. Fill in with ground to the height of the highest borer injury. P D B gas is heavier than air, and borers working above the level of application may not be killed. After cleaning the ground at the base of the tree and leveling it up where necessary, place the charge of P D B in an even band from 1 to 2 inches from the tree. Do not place the material against the bark. Cover over with 10 or 12 shovelfuls of earth, mounding up the tree 5 or 6 inches high.

The first shovel of earth should be finely divided, and should be carefully placed on the P D B. After forming the mound pack firmly by striking with the back of the shovel. In no case should clods or large stones be used in making the mound, as they may allow the gas to escape too rapidly.

As a precaution against possible injury it is advised that the mound be torn away, and any P D B remaining be removed from the base of the tree after 3 or 4 weeks. If it is desired to mound the trees over winter, the base of the tree can be left open for a few days to allow all the P D B to escape, after which the trees can be mounded again.

In applying P D B a crew of three men can work to good advantage, one going ahead and preparing the tree, one carrying and applying the material, and one following and covering the material. From 15 to 20 trees per hour per man can be treated in this way, at a cost of about 3 cents per tree.

Time of Application. Late summer and early fall is the best time to use P D B in controlling peach tree borers. It will be noticed in the short description of the life cycle of the peach tree borer that for the most part the moths have finished egg laying about the first of September. From observations made in Erie County it was determined that the egg laying period for 1921 was over by the last week of August. Treatments were started September 1st, and continued until October 1st with practically 100 percent kill. Not only were these treatments successful in plots under the direct care of the Bureau of Plant Industry, but were equally successful in the hands of the growers.

From observations made in Franklin County it was determined that the egg laying of the peach tree borer was practically over by September 10th. Treatments were started one week later. These treatments were as successful as those in Erie County. From the data gathered in these two counties and from observations made in other peach growing sections, it seems that beginning in the northern counties treatment should be placed any time during the first three weeks of September, and that the desirable time grows later farther south in the state. For the southern tier of counties the date is found to be a period of three weeks beginning September 15th.

If for any reason fall treatments have not been made, and the grower does not care to worm the trees by hand a spring application may be made. This treatment should take place as soon as the ground warms up in the spring. From soil temperatures taken in the southern half of the state in 1921, May 10th was found to be the right time to begin spring treatment. Applications made in two Franklin County orchards on May 10th, and examined May 26th gave 94 percent control. From like records taken in the northern part of the state, June 1 was found to be the time to begin. Treatments made June 2 in Erie County and checked June 23 gave 93 percent kill.

If a spring treatment is made it should always be followed by a fall treatment to catch the summer infestation of borers, after which yearly treatments need be repeated only in the fall.

Amount to Use. The amount of P D B necessary to treat

a tree varies with the size of the tree. One-half ounce is sufficient on a tree six to eight years old. On older and larger trees it may require three-fourths to one ounce. In weighing the amount of material Avoirdupois scales should be used. Postal scales are satisfactory. After weighing the desired amount secure a small vessel which will just hold the weighed dose, and use this vessel in measuring subsequent doses in the field.

When scales are not available for weighing P D B the amount may be determined by cutting a piece of heavy paper or card board to the size shown in Fig. 1.

To measure one ounce use a cylinder formed by rolling the edge of sheet marked "E F" over until it rests on the line "C D". The margin of the sheet between C D and A B is used as an overlap to close the cylinder, and may be fastened with paste or pinned together. To make a cylinder holding one half or three-fourths ounce cut the sheets at indicated lines. In measuring set cylinder on a smooth surface and fill level full.

Age of Trees. Trees 6 years or older may be treated with recommended strength (3-4 oz. to 1 oz.) of P D B without fear of injury. The treatment of younger trees is accompanied by some danger of injury, and prolonged exposure to the fumes may even cause the death of the tree. In no case is it advised to use P D B on trees younger than three years. On trees from 3 to 6 years successful treatment may be made under favorable conditions, by applying ½ ounce or less of material in the usual manner, and promptly removing the mound and charge after 14 days exposure.

It is hoped that a safe method of using P D B on trees under 3 years may be developed in the near future.

WARNING: P D B can not be used with safety on apple trees of any age.

P D B may be purchased from the following manufacturers: Hooker Electro-Chemical Co., 25 Pine St., New York, N. Y. Shipments made from Eschota, N. Y., and E. C. Klipstein & Sons Co., 644 Greenwich St., New York, N. Y. Shipments made from South Charleston, W. Va. Attempts are being made to get local dealers to carry P D B , and in many cases it is possible to obtain it from local dealers in spray materials.

The cost for 1921 varied from 20 to 35 cents per pound, according to amounts purchased. **THIS WARNING IS IMPORTANT - BUY ONLY THE PURE CRYSTALS,** since compounds are diluted with materials which are worthless, or may even prove harmful to the trees.

Mr. Randolph, of Virginia: I used three ounces instead of one, and after a short time we found borers.

Prof. Sanders: When did you make the application, and are you sure that you had genuine material?

Mr. Randolph: My neighbor tried it the second time, and got good results. He used the same material. Now I want to know where I fell down.

Prof. Sanders: Did you mound up well? Did you have a clay soil?

Mr. Randolph: I have a clay soil. We just scattered it on.

Prof. Sanders: I think it must have been due to a poor grade of material or the condition of your soil.

Member: In taking away or not taking away the gum that flows out of the borer holes, has it anything to do with the material penetrating?

Prof. Sanders: Not particularly. We simply clear away the rubbish, and put the material on in the recommended amount.

Member: Has anyone had any experience with casein spreader used in spraying - to make the spray stick?

Prof. Sanders: Resin sticker is better than casein spreader.

THE AMERICAN POMOLOGICAL SOCIETY

By R. B. Cruickshank, Columbus, Ohio.

I am happy to be with you here and to bring to you the greetings of the American Pomological Society and the Ohio State Horticultural Society. The latter organization will hold its annual meeting in Columbus next week and we extend to each of you a most cordial welcome to attend. We assure you a real welcome.

The American Pomological Society in undergoing reorganization for the purpose of more effectively doing the work which it deems essential for the well-being of the fruit industry. In this work it is asking the co-operation of all who are interested in fruitgrowing.

At a recent meeting of the Executive Committee, the following statement of the service that would be given the membership this year was decided upon:

"There is a great need in North America for a central organization which will combine the forces of existing fruit bodies and which can act as a clearing house of all information of interest to fruitgrowers. Much has already been accomplished but it will take more effort to build up such an organization of sufficient magnitude fully to satisfy this need and to finance its development and work. This can be done through the co-operation of the fruitgrowers of the United States and Canada.

The American Pomological Society, for over seventy years an influence for the betterment of the fruit industry, is now reorganized with a broader program and on a business basis,

with an active executive committee, a board of business managers and a paid secretary with office facilities. This Society has pledged itself to this end.

The services that will be given members in 1922 are:

1. The Annual Convention, with a valuable program.
2. The report of the proceedings of the Convention, together with the Pomological Annual containing much material indispensable both to commercial and amateur growers.
3. A quarterly bulletin containing other matter of concern to the Society and of permanent value.
4. Letters at frequent intervals which will embody information of current interest.
5. Reports on the size, condition and character of fruit crops gathered and disseminated.
6. A campaign for greater fruit consumption, carried on through all available organizations.
7. Efforts lent to the stimulation of export trade.
8. Affiliation with and service to State, Provincial and local horticultural societies.
9. Co-operation with fruit growers marketing associations.
10. Encouragement of better grading and packing.
11. Encouragement of the breeding of new fruits and the thorough testing and dissemination of valuable kinds.
12. Awarding of prizes for meritorious fruits, worthy inventions and for notable contributions to the science and practice of pomology.
13. Making public the best information on the new means and methods in fruit growing.
14. Condensed reviews of new books and bulletins.
15. Establishment of branches in the colleges of agriculture.
16. Registration of new fruits with accurate descriptions.
17. Legislation encouraged and fostered for the extension and safeguarding of the fruit interests.
18. Correspondence with the membership from the Secretary's office."

If these services appear to you to be valuable, we appeal for your help to the extent of individual membership at least. Send your application to the Secretary - Treasurer, R. B. Cruickshank, Columbus, Ohio.

Mr. Chase: Thirty years ago I began to be interested in the American Pomological Society, and I have been for many years a life member; it was one of the best investments that I have ever made. Thanks to the inspiration that I received many years ago from the American Pomological Society, I began testing apples, for hardiness, principally, and I was instrumental in carrying apples one hundred miles north of the

boundary line where they were formerly grown. I want to second every word which Professor Cruichshank has said.

The announcement of Committees, by President Fenstermacher, was then made:

Nominating Committee: Howard A. Chase, Harrison Nolt, Fred Dickenshied, W. S. Adams, R. J. Walton.

Resolutions Committee: R. D. Anthony, Theo. Pershing, Prof. H. A. Surface, D. N. Wertz, John Boyer, R. H. Garrahan.

Auditing Committee: E. C. Bowers, Jacob L. Reife, Harry Pierce.

The Committees were instructed to report at the Thursday morning session.

"QUESTION BOX"

Professor Fagan: In this room are many men who have been successful in their business. I want everyone to take part. At the end of every meeting there will be a chance to discuss all questions you want to ask.

Question: What fertilizer would you recommend for an apple orchard ten or twelve years old?

Answer: Nitrate of soda or sulphate of ammonia.

Mr. Vinson: Is it under sod or cultivation?

Answer: Sod, mainly and cultivated only a little. How much would you use to a tree?

Answer: Two pounds.

Prof. Anthony: We cannot answer that question until we know whether we are talking of sod or tillage. You can not hope to carry a sod apple orchard for any considerable length of time without adding some form of nitrogen. When it comes to cultivation you have an entirely different problem. Our experiments with cultivated orchards for ten or twelve years, where a good cover crop is plowed under annually to give organic matter to the soil, the addition of extra fertilizer did not give enough increased crop to pay for fertilizer.

Mr. Atkinson: Two years ago I tried a comparison of sulphate of ammonia and nitrate of soda. Previously I had used nitrate, and I found sulphate of ammonia was slow acting in comparison. I did not get as much for my money from sulphate of ammonia as from the nitrate of soda.

Mr. Balthaser: Would you apply nitrate once or more often.

Mr. Atkinson: I apply it twice. The first time as soon as I can get it on the ground in the spring, the second application about the first week of June, but you can put it on the middle of June or July and get good results. Year before last the late application did more good than the early one. It seemed to delay the buds, and my orchard was about the only one in Bucks County that escaped the frost.

Prof. Fagan: How old are the trees?

Mr. Atkinson: Nine years old. We varied the application according to the size of the tree. We spread it beyond the tip of the branches, and we never put it within three feet of the trunk.

Question: Is sulfate of ammonia applied in the same way?

Answer: Yes.

Question: Is the later application apt to stimulate late growth that will freeze back?

Answer: I have never had my orchard freeze.

Prof. Fagan: Mr. Cruickshank, what can you tell us of this?

Mr. Cruichshank: We use both sulphate of ammonia and nitrate of soda. Our growers are not tending to one or the other strongly. The purchase price is the thing that makes the decision. We don't think that sulphate of ammonia is enough slower in its action to be much of an argument one way or the other. Two years ago in our own orchard we used sulphate of ammonia in two applications. Apple trees in sod twenty to twenty-five years old we gave four pounds in the spring, and two pounds between the middle of June or July. I do not think we will do it again because it did not delay the growth very much. The next spring our trees did not seem to be behind those of our neighbors who did not use the application. We can not say that it helped us out any last year in that respect.

Question: Would nitrate have any effect on the color of the fruit?

Prof. Anthony: Pushing your trees with nitrate delays maturity of your foilage and of your fruit. Consequently you can pick unfertilized peaches a week ahead of fertilized peaches. I know one grower who uses that method to prolong his season. The same is true of apples, although not as much so as peaches. In the delayed maturity, especially where you push the foilage growth, the fruit is shaded, and usually of lower color.

Member: You can get color even if you use nitrate. This year and last year I had color on Rome Beauties to such an extent that people did not believe they were Rome Beauties. We leave them on the trees until they get fully mature, and they have color.

Memebr: The last address that Mr. Gabriel Hiester gave before this Society dealt with the use of nitrate of soda, especially with reference to Smokehouse and York Imperial, to make them hold on longer in the fall to get the additional ten days or two weeks sunlight to increase the color. His inference was that the decrease in color caused by the use of nitrate of soda was overcome by allowing it to hang on and get the sun for that much longer time.

Member: We can buy sulphate of ammonia cheaper, and from an economic standpoint we find it best to use that, and the results are about as good as with nitrate. We omitted the application on a number of trees last spring, and we did not get apples on those trees. Now we can not say that the sulphate of ammonia saved the crop, but we think there is something to it. It gave the buds vigor at the time they needed it. Whether this is only theory, I can not say, but we did have apples where we applied the sulphate of ammonia, and none where we did not.

Prof. Anthony: When you put nitrate on the sod tree it has a deeper color of foilage. That same condition very likely does effect the total amount of color in the fruit. We have all seen trees pushed too much. It boosts trees often into too heavy growth, but there is a happy medium between excessive growth and not enough. Good orcharding is balancing the two extremes. Dense foliage protects the fruit from the sun's rays. The late application of nitrogen may be worth while sometimes, but it is dangerous. We never know in this state whether we will have two below or twenty below zero and you can not carry apple trees through a severe winter unless they are thoroughly mature. In 1918 you know what happened in the northern part of the state to trees that were not mature.

Mr. Fenstermacher: Is not color a question mainly of sunlight, and thus a question of pruning?

Question: Is it wise to use the same amount of nitrate on trees grown in sod, indiscriminately? How much should we use?

Prof. Fagan: That depends upon the vigor, color of foliage, etc. Vary it according to the tree. Study the individual needs of the tree.

Question: By using nitrogen on apple trees affected by Fire Blight, will it be a detriment to them, or will it help them along?

Mr. Smith: An excessive use of nitrogen will tend to cause excessive and weakened growth, which will therefore be more susceptible to blight.

Question: Does nitrogen make the peaches bitter some years?

Answer: No, that is from Yellows, or old age.

Question: If you have an apple orchard in sod that you wish to turn down, when is the best time to do it?

Answer: In the spring as early as you can plow it.

Question: Do you recommend the application of acid phosphate, following manure?

Member: No, we certainly would not.

Question: Some one has said do not plow at all. What I want to know is the best time of the year to do plowing?

Mr. Chase: Avoid plowing in the fall. There is danger of injury to the roots. If I have an orchard to plow in the fall I always caution the men not to plow deep. If you must plow in the fall, plow very shallow and level off the ground, and put in a late cover crop, even if only rye.

Member: After harrowing in the spring I let the weeds come up and do my plowing in the fall to keep mice out of the orchard. My loss through mice is nothing at all.

Mr. Griest: I agree with those who say that plowing is necessary at least once in a while. I once thought we could do all of our cultivation with a disk, but it seems there comes a time after six or eight years that the ground gets so hard and packed, that the disk will not go deep enough. Disking works the stones to the top. We can not, with spraying in spring, and hauling apples in the fall, carry on our work without a lot of going back and forth in rows. Those rows get so hard that finally the disk will hardly touch it. I think shallow plowing is necessary once in a while. Do it in the spring if you can, but if you have too large an area for it to be done entirely in the spring, do some in the fall and some in the spring. However, make a point of shallow plowing.

Question: Can anyone give any information on the pasteurizing and bottling of sweet cider? Also the making of apple butter by the steam process?

Mr. Leonard: I have tried it in barrels. I had ten or twelve barrels that I could not sell, and tried it out on that by putting the cider in an old brass kettle and heated it to 190 degrees. As soon as it came to 190 degrees we cooled it off. Test it about the middle of the kettle. If it is boiling around the sides, pay no attention to that, but test in the middle regardless of the edges. Stir it frequently, of course. I find that the customers do not want it boiled. We find that it pays to pasturize cider.

Prof. Fagan: At the College we pasteurize cider in bottles. Now what has someone to say about boiling apple butter by the steam process instead of using direct fire?

Member: That is a very satisfactory method. We do not use anything but an ordinary barrel. You must keep it boiling, and you will have the finest kind of apple butter.

Question: Is the flavor as good as by the old method of boiling?

Member: Every bit as good, the finest.

WEDNESDAY AFTERNOON, JANUARY 25, 1922

GROWING APPLES BY THE SOD MULCH METHOD

By Dr. J. S. Rittenhouse, Lorane, Pa.

When our Secretary asked me to talk on "Growing Apples by the Sod Mulch Method," I accepted at once because I

thought it would be easy. My son and I have had sixteen years' experience in planting apple trees in sod, and yet the more I thought of the subject the more difficult it seemed to be to think of something to say that might be of interest or real benefit to anyone else.

By inheritance I am a lover of trees, and it was long my desire to have an orchard. Finally, I acquired a piece of ground, and determined on the sod mulch method of developing an orchard, as offering me the best chance for results within a limited time and with still more limited capital. It was at a time when it was unknown whether San Jose scale could be controlled in the East. The scale was the leading topic of discussion at Horticultural meetings. The String-fellow method of planting trees was much talked about, and the sod mulch orchards of Cox of Ohio and Hitchings of New York were a great deal in print. The first box of apple trees that we planted in sod, in spade holes, by a sort of modified String-fellow method, reached us in the spring of 1906. The box had labels showing that the trees had been officially insepcted and declared frree from pernicious insects and diseases, and also that they had been fumigated. I opened the box, and found about 50 percent of the trees pretty well sprinkled with live San Jose scale, "San Joe" we said then. I was shocked, but I planted those trees, feeling it had a good chance to see if "scale" could be controlled, and believing that if we could not control the scale on those little trees there would be no use in going further into the orchard business. With a small hand sprayer we used the old home-boiled 17-22 lime-sulphur spray, and thoroughly cleaned up the trees, and have been increasing our apple tree plantings yearly since that time. In latter years we have been using the concentrated lime-sulphur solution, with high powered rigs and spray guns. But the old 17-22 formula of Surface of Pennsylvania still appeals to me. You can see where you have sprayed, and I believe there is a protective covering on the trees that lasts longer than the concentrated solution. If I were equipped with sufficiently large cooking apparatus, I believe I would still use it as the dormant spray.

The land on which we started our orchard was in sod, and in sod by courtesy only. It was a field of thirty-five acres without a building, and had been farmed on halves for a long time before. When I bought it the crops were all taken off, and only a very little fertility returned each year. There was some grass, a little clover, and a beautiful collection of dandelion, narrow-leaved dock, plantain, wild mustard, and a magnificient vista of wild carrot when in blossom, - it was a farmed-out field. The soil is naturally good,-a rather heavy clay loam with a stiff subsoil. That was the condition when we began planting. As I said before, we planted the trees in holes made

no larger than needed to work the shovel. The trees were planter 22½ feet apart, using apple trees as fillers. Of the first plantings a great many of the fillers have been taken out, but most of the semi-permanents will not interfere with the permanent trees for a great many more years.

The weeds and grass were mowed two or three times each year, the first mowing of each season was raked together, and the young trees mulched. The later mowings of each season were allowed to lie where they fell. In a few years the grass and the weeds grew more rank, then the weeds began to disappear, and we had more grass and clover. As the trees grew larger, the grasses grew well in the spring, and we mowed them about the first of July, and there has not been much growth later in the season. We mowed the grass only once a year, and let it lie where it fell, the tree roots practically penetrating all of the soil. About four years ago we began to notice that the growth of grass was not as much as we liked, but the war had come on, and the price of chemical fertilizer seemed beyond reach. In the spring of 1920 we first used chemical fertilizer, five pounds of nitrate of soda and ten pounds of 16% acid phosphate to the tree. This was repeated in 1921, and I think will be continued indefinitely hereafter. We are again getting a much better stand of grass, and the clovers are beginning to reappear.

We spray four or five times in a season, prune annually, thin the fruit thoroughly, pick and handle it carefully, and try to pack it honestly. The fruit is above the average in appearance and quality. It always sells above the usual market price. The same customers want it year after year. The trees have made a satisfactory growth, began to bear reasonably early, and have been bearing annually good crops of fruit. We have a great many varieties af apples, all of which have done as well as could be expected, except the Yellow Transparent. This variety, supposed to be an unusually early bearer, has not yet borne a full crop.

You all remember the erratic spring of 1921. Our apple trees were practically in full bloom on the 28th of March, full five weeks before normal. The temperature at noon of that day was more thtan eighty. In the afternoon a strong wind came up, and the thermometer began to fall rapidly, and by the morning of the 29th of March, the temperature on our home porch was twenty-three degrees, about a week later it fell to twenty degrees at the same place. The temperature in the orchard was no doubt lower. We despaired of getting a crop of fruit, examined many blossoms, and found the ovarian of blossom after blossom dead. But here and there on the outer scion of the cluster we found some unopened buds that seemed alive. On account of the unusual season we were caught without having put on the pre-blossom spray. On

discovering these few live buds we immediately got busy and put on a 1 to 30 lime-sulphur spray with Black Leaf 40. After the fruit began to set we thought we might get a third of the apples we had in 1920. As picking time approached we had gradually increased our estimate to 75 percent of the crop of the year before. The net result of that compared with 1920 would give us about 89 percent of a crop. The farm orchards all about us had no apples. There were very few apples in the country except in our orchard. I don't know why we had these apples, unless it was due to the timely application of the pre-blossom spray, or our previous way of handling the trees, or a combination of factors, some of which we may not know. You can all appreciate that it was a heartening sight to have an orchard last fall, many trees of which were loaded with fruit to the breaking point.

The great advantage of a sod mulch orchard, as I see it, is that we can work in it at any time without having to contend with mud or dust. When not raining it is at any time in condition to get in to spray, prune, thin or pick fruit. The dropped fruit is clean and little bruised, and sells at a good price, because we have a good local market in Reading, which has a population of about 125,000. We are only six miles from Reading.

It may be interesting to know the names of the elading varities of apples which did best, and those which were practically a failure because of the unusual weather conditions of last spring. Smokehouse and Paragon had practically no fruit; Delicious was an almost total failure; Wealthy had a fair crop (they had a large crop the year before); Duchess was hard hit, but had some apples; Stayman had a 50 percent crop; Jonathan about 80 percent; Rome and King David each had a 100 percent crop, and although as we thought well thinned had some branches broken by the weight of the fruit. Our Yorks and McIntosh are not yet in full bearing, but according to the amount of bloom had a fair crop.

Of the new Golden Delicious we have two trees only, planted the first year they were introduced, and at the time of planting we took a few scions and set them into an older tree. The young trees and the grafts had their first blossoms last year. Altogether there were about fifteen blossom clusters, and we thinned them one apple to a cluster, and got about twelve mature apples. The variety seems to bloom a little late, about the time of the Rome Beauty.

There is another observation to which I would like to give expression, and that is, that the old idea that apple trees root deeper when cultivated, than when in sod mulch, is a fallacy. We have taken out fillers in both the sod mulch orchard, and in a part of the orchard that we have cultivated from the beginning, for comparison. The trees in the sod

mulch orchard root just as extensively and as deeply as in the cultivated orchards. The soil in the sod mulch orchard is more uniformly moist both near the surface and deeper down than in the cultivated orchard.

Question: The gentlemen who just spoke said that "the trees bore in a reasonably short time." I would like to ask how long that is. My experience with a sod mulch system and other systems is that cultivated apple trees bear earlier than others. What is a reasonable time?

Answer: I do not know because that depends upon varieties. But it has always been our experience that in the small part of the orchard that we cultivated, particularly Staymans, that we had apples earlier than in other parts of the orchard. With other varieties I have no experience.

Question: How do you prevent mice in sod mulch?

Answer: Bank up the ground, but we have had considerable mice injury.

Question: How do you bank up?

Answer: No definite way, and no definite height, about eight or ten inches.

Question: Do you take down the bank in the spring?

Answer: Yes.

Question: Do you plant in sod, or do you cultivate for a few years?

Answer: Plant in sod, and leave in sod.

Question: Do you mulch to keep the sod from growing tight around the trees?

Answer: With reference to mulching, when we mulch young trees we try to keep it away from the stem of the tree for about a foot, and then keep that circle. Have a little bank of ground.

Question: How early do your trees bear, that were planted in sod?

Answer: At about six or seven years of age.

Member: I have tried banking for mice, and two winters ago I found I simply had nests of mice there. They made their nests right there at the base of the tree, and it failed. I get better satisfaction to simply scrape the ground away from the tree in fall for eighteen inches to two feet.

Member: We do that before we bank, and in banking a tree I think it is very important that we have soil, and not a mixture of grass with the bank.

Mr. Atkinson: I think that is true. I carefully bank my trees, and have found the field mice and pine mice making a regular bees' nest out of those banks. Of course, some of them may have a different variety of mice than we have to contend with.

Member: I have a part of my orchard in sod and quite a lot of grass, and by carefully taking the grass away, the soil

can be lightly hoed up in a dirt bank. I never had a tree injured by mice.

Member: A few years ago we used hogs. A neighbor left his hogs run freely, and they cleaned up the field mice, but they are a nuisance.

Question: Did they hurt the orchard?

Answer: Having the hogs in the orchard took care of the mice, but I must say that the hogs sometimes ate the apple trees, and I wonder whether the one was worse than the other.

Member: In our case they did not injure the young trees, but there was a great deal of alfalfa and other grass for them to feed on.

Member: We have an orchard of trees about eight to twenty years old in sod mulch, which has been so for five or six years. The hogs running there do not do any injury. We have another orchard in which the trees are now seven to ten years of age, and the hogs have been running in there for about five years, and they do not do any damage. Do you think they will do any harm later on? I would like a statement on this. We have been doing this for three or four years or more, and it seems to do away with the mice, but perhaps they will get in after a while.

Mr. Hershey: I have had no experience in this line, but I have seen the results of hogs in an orchard one time. They were confined in a small space, and had gotten rid of all green stuff. One night they started barking trees and before morning they had ruined about a dozen trees which were at least twenty years old by tearing off the bark as high as the crotches. There is apparently no danger when there is plenty of vegetation for them to feed on.

Mr. Runk: The hogs rub their bodies against the trees, and the natural fat of the bodies injuries the trees. Two years ago on trees nine years old they simply ruined every tree they rubbed. As an orchard proposition I do not advise the use of hogs in an orchard. They do catch the mice, but there are other ways to get the mice. The best way we have found is to keep the land clean of grass around the trunk.

Member: Is there danger of over mulching an orchard? I have an orchard that has never had a failure. I had almost a full crop of Northern Spy in that orchard this year. I do not know whether it is due to the sod mulch or not? I am getting a pretty heavy mulch under those trees, anything that I happen to have, and it seems to me that during the last two years there is more of a tendency for the apples to develop Baldwin Spot. I am wondering whether the extra supply of mulch has any connection with the Baldwin Spot?

Prof. Fagan: The latest theory is that inadequate moisture supply is largely responsible for the Spot, but one would think that if that was the case the sod mulch would be the

thing for it because you have a more continuous supply of moisture.

Question: Do feeding roots come up in that mulch?
Answer: Yes, they do.

COMMERCIAL PEACH GROWING

By J. E. Klahre, District Manager,

The American Fruit Growers, Inc., Hancock, Md.

Those who are engaged in growing peaches for profit, are vitally interested in the factors which influence the amount or extent of that profit. Fundamentally, profit is the margin between cost and selling price. I do not intend to discuss the factors influencing the cost of production but shall confine my discussion to the factors influencing the selling price.

The most important single factor influencing the selling price of peaches is **quality,** and that the amount of your profit is likely to be determined by the **quantity** of high quality fruit at your disposal. This would be true if it were not for the existence of another factor which seems to have a far more reaching effect in many cases than either quality or quantity. That factor is **supply and demand.**

Since we wish to attack this problem of securing profits in a logical manner, we must know just what we can do to grow fruit of better **quality,** how to increase the **yield** of high quality fruit, and finally having satisfied ourselves that we have done all in our power to increase our profits in this manner, we want to dispose of our crop to the best advantage.

Quality is dependent on a number of factors, but practically all of them, fortunately, are more or less under our control. **Elevation** for instance influences the color and size of the fruit, gives it the life which it would otherwise not have. The **soil** influences the growth of the tree, and by its depth, tilth and fertility has an important effect on the quality of the fruit. Both of these factors can be determined or regulated by the owner. The grower is likewise responsible for the quality of the fruit as it is effected by what we may properly term cultural practices. A well proportioned pruning program, followed by the application of the necessary fertilizing elements in the correct proportions, and supplemented by thorough cultivation to insure sufficient moisture to mature the crop, all these things add to the quality of the fruit. Spraying and dusting protect the crop from the insects and fungous diseases which tend to make peach growing such a hazardous undertaking, while careful packing presents the product to the consumer in the most attractive shape. Eash of these operations, you will observe, is influenced to a greater or less extent by the desires of the grower.

A PENNSYLVANIA 3 YEAR OLD PEACH ORCHARD

Subject always to weather conditions, the quantity of fruit is almost as readily determined as the quality, and we are able to a certain extent to insure ourselves from the loss attending a frost by selecting orchard sites with sufficient elevation and air drainage to minimize the hazard in that respect.

What, then, is the limiting factor which determines the profits from commercial peach growing? H. P. Gould, who has written a very good book on peach growing, says "The profitableness of peach growing in any location depends in no small measure on the sequence in which the Elberta peach ripens there in comparison with its ripening period in other localities with which it comes in contact on the markets." In other words, in so far as we are concerned, the limiting factor is supply and demand, which may properly be called the geography of peach growing.

Let us examine the peach growing areas in the eastern and southern sections of the country and ascertain, if possible, what effect they have on the profits from our ventures here in the north. With the Elberta only in mind, the peach season commences about July 1st in northeastern Texas. Over a series of years, the section which comes in next is usually southwestern Arkansas, where the Elberta season lasts from July 10th to the 15th, while the Fort Valley section usually ships Elbertas from July 15th to 20th, and it sometimes happens that the growers in Georgia are shipping Elbertas prior to Arkansas. The Elberta season in North Carolina follows close on the heels of the Georgia and Arkansas season, and is over by the 5th of August. With the exception of minor shipments from southern Virginia and West Virginia the next section of importance in order of ripening of the Elberta is northern West Virginia and Maryland, where the season normally starts about August 20th and continues to the first of September. New Jersey and Delaware usually start shipping Elbertas about the 25th of August and continue until the 5th of September. The usual date of ripening of the Elbertas in southern and southeastern Pennsylvania is September 1st to 10th, although certain sections, notably that region north of Hagerstown, is somewhat earlier.

What does this mean to you as a grower of peaches in Pennsylvania? It means that from about July 10th until you start shipping Elbertas in late August, or early September, there is an almost constant supply of Elbertas from districts south of you. That in itself is a statement without much meaning, unless further analyzed. But let me show you how vital this fact is to you, even though you are not shipping peaches in car lots to the larger markets.—Although I have not had access to the government records, it has been reported that the Georgia crop last year was in excess of 6,000 cars. Most of this fruit is consumed in eastern and northern mar-

kets, and is not all confined to the large cities. I know one firm which canvased thoroughly every town of 2,000 or more inhabitants between Johnstown and Harrisburg, and several towns east of Harrisburg in an endeavor to dispose of Georgia peaches in carloads if possible, but in less that carloads if necessary. Under normal conditions the early peaches would have been ripening in Pennsylvania at that time, and you would certainly have felt the effect of the southern competition.

But there are other ways in which your profits are influenced by your southern neighbors. All of you know that the peach market is extremely fickle, and that it fluctuates violently when there is no reason apparent to the grower. There are several reasons for this fact. The peach market is usually established during the Georgia shipping season. The appearance of worms or brown rot in Georgia peaches has had, and probably will continue to have, a very far reaching influence. Buyers who appreciate the fear of brown rot on the part of the wholesaler and retailer are quite likely to use this fact in securing fruit at considerably lower prices from the grower.

During the past season I happened to be engaged in packing Elbertas in southwestern Arkansas. Because of the fact that the Texas crop of Elbertas was a failure insofar as carrying qualities were concerned, I knew of several buyers who remained in our packing house almost a week before buying a car load of peaches. They were afraid to buy on surface indications, preferring to wait until some of our fruit arrived on the market, in order to assure themselves that Arkansas Elbertas had no brown rot. If we had been depending on local buyers our profits certainly would have suffered.

The readiness with which the public absorbs the shipments from the south certainly has a marked effect on the price paid for the same variety from later sections. Due to the perishable nature of the fruit, the disposal of a crop of peaches, particularly where that crop is largely Elbertas, is usually a matter of days rather than weeks. Dealers are not slow to take advantage of that fact, and relying on the information gained in the crops from southern districts, use every means in their power to recoup losses and increase gains by manipulation of the crops from northern sections.

But the most marked effect of the southern grown peach, and by that I mean the peach grown in any section earlier than our own, is the residual effect on the market. Following each other so closely as the shipping seasons of the different sections invariably do, there is a sluggish period on the market almost every year. The effect is so marked, and so far reaching as to merit our closest attention. Let me cite an example. As I have mentioned before, Georgia had an exceptionally large crop of peaches last year. The ripening period was several weeks earlier than usual, throwing the peak of the Elberta

season about July 10th, on which date the first cars were moving from southwestern Arkansas. What was the effect on the f. o. b. price of the Arkansas Elbertas? The best quotation for the first two days of the season was $2.25, but in about three days, when the bulk of the southern crop had disappeared from the mid-west markets, the price began to jump about $.25 each day, until at the end of the twelve-day season the f. o. b. price for the same quality peach was $4.50 per bushel, while two days later on my return through North Carolina, I learned that choice Elbertas were being quoted at $2.50 per bushel on board the car. This difference in price in the case of the North Carolina peaches was due to the fact that they were being shipped to New York, Philadelphia, and Boston, at which points there were about eight hundred cars of Georgia Elbertas in storage, and the influence of the Georgia peach crop was felt as far north as New York State, because not all of them had been removed from storage when New York Carmens were being shipped.

I think you will see from what I have said that the price you will receive for your peaches is quite likely to be influenced quite markedly by concurrent shipments from districts earlier than that in which you happen to be located. How can you overcome the disadvantage arising from your location? This is not an easy question to answer, but there are certain ways in which this effect can be minimized.

Those of you who are contemplating planting new orchards or replanting old orchards, will, I am sure, pay much more attention in the future than you have in the past to the varieties which you plant. This is of vital importance.

Those of you who have large bearing orchards of varieties which conflict with Elbertas, or other more salable varieties, will take advantage of all the information sent out by your experiment station concerning the methods of regulating the ripening period of those varieties by means of varied applications of fertilizers.

And all of you, whether you have just planted your orchard or whether it is in full bearing at this time, will, I am sure, pay a great deal more attention to your neighbors on the south and the east. You will know his varieties, his expected crop, and when that crop is to be marketed. Furthermore, you will have a daily acquaintance with the market conditions, not only of your local market, but in the large city markets as well.

You have seen how your profits are vitally effected not only by what kind of a peach you grow, and how many of them you sell but also by what your southern neighbor is growing and selling. Your local co-operative association, your state bureau of markets, and all of the government agencies, as well as the State College and Experiment Station an-

nually publish an immense amount of valuable information dealing with this subject, but it remains for you to reap full advantages from these facilities. The profit from commercial peach growing is two-thirds under your control, and a greater part of the remaining third can be secured by facilities already provided, presuming of course that you are on the alert.

Question: How can they afford to send peaches from Texas and California and compete with us?

Mr. Klahre: I can not tell you. I know that on August 20 of last year there were on the New York market Georgia peaches, California peaches, a few Arkansas peaches, and the New York State shipments were just coming in. You are aware that we had a crop failure here.

Member: In California last summer looking over peach trees, I asked how many times they sprayed, and found that they spray once in winter for peach leaf curl. They do not have trouble with curculio, etc. I inquired from a lot of others, and they have no wet weather, and what they save in spraying they can use to pay freight, I suppose. Their trees are larger and their crop is more even.

Mr. Klahre: I think their co-operative packing associations have something to do with it.

Mr. Crossman: I am anxious to know because we have just started in Montgomery County, with headquarters at Collegeville, a packing and selling organization, and we are going to be up against it to move our peaches this year to advantage. If anybody knows anything about local shipping associations or suggestions for co-operative packing of apples, I want that information for the growers in our section.

Mr. Klahre: You must know first whether you are going to ship to local markets or to distant markets. Also the container will have to be determined by the limits to which you ship. In Detroit they want bushel baskets; while from Georgia they come in Georgia carriers. A big packing house in Arkansas is arranged for bushel baskets only.

Question: How about peach sorting tables and packing tables?

Mr. Klahre: There are as many peach sorting tables and packing tables as there are individual growers.

Question: How long is it profitable to hold peaches in storage?

Mr. Klahre: The Georgia Elberta season was closed about the 10th to 12th of July. On the 20th of August in New York they were just being brought out of storage, and there was no opposition. In Chicago they did not hold them that long. I do not know just how long they will last.

APPLE GROWING IN OHIO

By R. B. Cruickshank, The Ohio State University

Although Ohio is not as large as Pennsylvania, yet it does cover some 30,000 square miles. The subject "Apple Growing in Ohio," therefore, infers that I am to cover a lot of ground in this discussion. As a matter of fact, I propose to give you something of a survey of our fruit conditions, problems, practices, plans, developments and expectations. We have reached a more or less stable situation in apple growing, as I presume you have, and I, therefore, have nothing startling to report. I think you will find much similarity between your apple growing and ours.

The Geography of Fruit Growing: Ohio has two principal apple growing sections. One extends along the southern shore of Lake Erie; the other one includes the more or less hilly section of the state extending along the Ohio River from a point of about the latitude of Pittsburgh around to Cincinnati. In the former section, nearly all fruits are grown. The farms are smaller and more diversified. A large proportion of the fruit is hauled into the market by truck either by the growers themselves or by men who make a business of gathering the fruit and selling it in town. Most of the apples grown in the hilly sections are shipped. Practically nothing but apples are grown in this region. At one time there were a number of important peach shipping points but, because of diseases, poor markets and unfavorable climate, these points have practically ceased to exist so far as any importance is concerned.

Although the lake shore and the Ohio River counties are the important apple producing sections, yet we have rather good orchards more or less widely scattered over all parts of the state. These, when well located and cared for, are profitable enterprises in as much as they are usually located close to good local markets.

Tendencies: Census reports show a decline in bearing trees since 1910 of 30% and in non-bearing trees of 16%. In other words, our bearing apple trees have been reduced in 10 years from approximately 8,500,00 to 6,000,000 trees and our non-bearing trees from approximately 2,400,000 to 2,000,000. This decline is more apparent than real. As in the case of many other states, the large loss is referable, mostly to the general decline in the farm orchards rather than in the commercial sections. The production is, therefore, being fairly well maintained. Significant of this condition are figures which show a decline in the number of farms in Ohio reporting apple trees, both bearing and young. In 1910 about 200,000 farms had bearing trees, in 1920 this was reduced to 175,000; in 1910 about 78,000 farms reported young trees, in 1920 there were

but 48,000. At the present time, therefore, but 74% of the farms in the Buckeye state have bearing apple trees and but 68% have young trees. This would indicate a continuation of the decline so that it may be expected that the 1930 census will show probably not more then 60% of our farms having any apple trees whatever.

The important plantings, therefore, have been made by the more interested commercial men. Those who have had orchards have increased their holdings; the non-commercial orchard has decreased in numbers.

Varieties: In the northern part of the state the Baldwin is still the most important variety. While it has its faults, we really have nothing better as a substitute. To some extent, substitution is being made by the planting of several varieties rather than any particular one. These include McIntosh, Stayman, Jonathan and Delicious. We are in great need in northern Ohio of a superior winter variety of red color, good quality, high production and adapted to conditions there.

Rome Beauty constitutes probably 60% of the plantings in the southern part of the state. It is being more heavily planted than any other variety. In addition, there is considerable planting of Grimes, Stayman, Jonathan and Ensee. The last named is a seedling of Rome and the same size and shape, of much higher quality, duller color, and apparently of about the same productivity. Rome Beauty is to southern Ohio pretty much what York Imperial is to Pennsylvania. The Ohio State Horticultural Society has erected to it a monument as has your Association to the York Imperial.

Pruning: As did other eastern states, Ohio went through a perod of severe pruning practices. The pendulum has swung somewhat the other way and we now have some growers who feel that there should be no pruning whatever. However, the great bulk of our men believe that a moderate systematic, annual pruning is the most advisable system. This includes a general thinning out of the small wood wherever it has become too crowded. In addition, some of the remaining wood is headed back slightly for the purpose of stimulating the development of fruit spurs back of the cut. This is done in the attempt to have bearing wood pretty much throughout the tree rather than merely on the outside of the branches.

An instance of the results of some demonstration work in Lawrence County, which is our chief producing county of the state, may be of interest. There has been a tendency for some time to do little pruning on Rome Beauty trees. A demonstration was held followng which the owner pruned ten rows of his orchard. These contained 214 trees. The adjacent ten rows containing 202 trees were used as a check. The ten pruned rows produced 498 barrels, or an average of 7 bushels

per tree; the ten unpruned rows produced 241 barrels, or an average of 3½ bushels per tree. The cost of pruning was 54 cents per tree. The trees were about twenty-five years old. The gross income of the ten pruned rows, after deducting the cost of pruning, was $3,170.50; the gross income from the ten unpruned rows was $1,563. The income as a result of pruning was, therefore, about doubled. The fruit from the pruned trees were of better size, better color, and because of the fact that spraying was more easily done, of higher quality. It therefore graded out much better and sold for a better price. In addition, the pruned trees received less fertilizer and the harvest operations were made easier.

Our recommendations in Ohio are, as suggested above, for a moderate annual thinning out with some slight heading in. This is the system which is being followed by the bulk of our growers so far as they are able.

These figures are somewhat substantiated by others reported recently from Oregon. In a study of orchard practices in the Hood River Valley and covering a large number of farms the investigators were able to group these orchards in three classes as regards the amount of production. The first class averaged 386 packed boxes per acre, the second class 257 packed boxes per acre and the third class 186 packed boxes per acre. The orchards in the first group through a term of six years averaged 78% of the orchards annually pruned, while the third group averaged only 48% annually pruned. This would seem to indicate a definite correlation between a system of annual pruning and production.

So far as young trees are concerned, there is an inclination to do only as much pruning as may be necessary to develop the type desired. Most of the men have come to believe that the modified—leader shape is the most advisable for the most varieties. Keeping this idea in mind the trees are otherwise allowed to grow more or less naturally according to variety.

Insect and Disease Control: Ohio is doing very little dusting. Where it is practised at all, it is generally in the way of an accessory to the spraying. The spray gun has become a universal piece of equipment and a tendency is each year more and more toward the use of high powered sprayers. While in some states owners are finding fault with the spray gun, due to the fact the hired hands are inclined to do less careful work than with the spray rods, yet I have heard no talk in Ohio of going back to the old method.

Our chief troubles are San Jose scale, codling moth worm, curculio, scab, black rot, blotch, and in some years fire blight. We have a feeling that the scale is once again coming back in great numbers. In some sections where dormant applica-

tions were necessary only in alternate years annual control will have to be practiced again.

We believe that we are getting better control of apple scab by a pre-pink application rather than at the time of full pink. This means that the spraying should be done about the time the center blossom begins to show a little color rather than later.

One of the most destructive diseases until recently has been apple blotch. We had not found a control for it until about two years ago. We then learned that the application had to be within fourteen days after the petal fall application. In addition, another spraying should be made two weeks later. On earlier varieties like Dutchess and Astrachan it is necessary to apply the spray within seven to ten days. In cases of severe infection Bordeaux mixture appears to be advisable even though it may result in some russeting of the fruit. For slight infections lime-sulphur at regular summer strength should be sufficient. I understand that the disease has reached Pennsylvania only in a minor way. It will unquestionably spread over more of your state. It would be worth while checking it as rapidly as it appears.

Fertilization: Probably 90% of the apple orchards in Ohio are standing in sod. The use of commercial nitrogenous fertilizers is practised in all sections particularly in the poorer hill areas. Inasmuch as you in Pennsylvania are also following rather thoroughly the practice of fertilization, the only thing of interest to report is perhaps the constant growth of the practice with us. In 1919 we used about 500 tons, in 1920 about 1,100 tons, and in 1921 about 1,500 tons. This was enough to fertilize at least 20% of all the older trees in the state.

Sulphate of ammonia is being used equally as much as nitrate of soda. We have been able to observe no particular differences in the results obtained between one and the other. The fact that sulphate of ammonia has been the cheaper has been the chief reason for the increase in its use.

We are fertilizing our young trees as well as our old ones. We believe that the advisable thing to do is to grow as large trees as we can within reason preceding the bearing age. This is done by the use of fertilizers, manure, or cultivation. If we can develop a large leaf surface, it appears reasonable to think that the necessary balance between the carbohydrates made in the leaves and the nitrogen coming from the soil will come about earlier when the development of the amount of foliage has been rapid. The year preceding the one in which it is anticipated that the trees should come into bearing, it may be advisable to reduce the nitrate supply by withholding fertilization or reducing cultivation.

Our sod orchards are fertilized not only to stimulate the trees but also to produce a large amount of mulch material. When acid phosphate is used either with the nitrate of soda or the sulphate of ammonia, there is a tendency for red and white clover to develop strongly in the sod. When a nitrogen carrier is used alone, the grasses which appear to the exclusion of the clovers are blue grass, timothy, red top, and orchard grass. It is possible even on poor soil to grow a ton or more of sun-dried material to the acre. This is cut and used for mulching purposes. It is better orchard practice and economy to do this than to haul in material from the outside.

We are convinced that orchards can be grown in sod profitably but that in sod there must absolutely be fertilization with some nitrogen carrier. This is true even though the orchards may be standing in some of our richest soils. Under cultivation, fertilization may or may not be profitable depending upon the fertility of the soil.

Marketing: Ohio is dotted almost throughout with cities varying from 10,000 in population up to Cleveland which has about three-quarters of a million. With the exception of south-eastern Ohio, these cities are fairly close together. This means that fruit growers have many opportunities to carry on a system of local marketing. Many of them have developed a heavy and consistent private business with fruit stores, groceries or ultimate consumers. In some cases growers have almost a monopoly on their local market. There are no other large growers near and the only competition felt is from some fruit which may be shipped in. As a rule, these growers nurse their markets with good quality stuff, reasonable prices, and consistent deliveries. The consumers have learned to prefer the home grown fruit to that shipped in. With the growth of Ohio cities, this type of marketing will have a much larger development.

The south-eastern or so-called Rome Beauty section is mostly a shipping area. Apples are marketed chiefly in barrels although the baskets are coming into considerable favor for certain varieties. There has been no real marketing system. Growers have sold individually and haphazardly. In some years this has been satisfactory and in others it has certainly not been so. Were it not for the fact that the Rome Beauty area in the east is limited and that the variety has a heavy demand on the market, it is probable that the marketing difficulties in this section would have been much more severe.

There has been, of course, considerable talk for many years back with reference to co-operative marketing particularly from the shipping areas. Nothing much has developed from it.

However, at its last annual meeting, the Ohio State Horticultural Society appointed a committee to co-operate

with the Ohio Farm Bureau Federation in the matter of the organizing of apple packing associations. That committee has been active during the past year. In order that Ohio growers might see in action a number of local packing houses, a trip was organized to western New York early in October. About seventy-five growers representing eighteen counties made the trip. Two days were spent in Niagara and Orleans counties. During that survey, we were able to persuade some of our key men that the local packing house association was a step in advance.

Since that time, we have been able to organize eight associations and there are prospects of a few more. We are organizing with about 10,000 barrels as a minimum output. We are trying to keep the associations as small in membership as possible with such a minimum.

Next week at the regular meeting of the Ohio State Horticultural Society, it is proposed that representatives from these local associations will organize a central association on a state-wide basis. It is probable that this center will not function fully during the first year, but we are anxious to adopt grades and standards and a trademark and to do some inspection.

Ohio is organizing partly, of course, for self-protection against competition from other states. However, the chief things in mind are a better standardization of the business, some consistent advertising, and a greater sales force. We feel that our central association will probably co-operate more than it will compete with the central associations in other states. We look forward to the time when our central office will be in constant touch with the central offices in western New York, Michigan, Illinois, Pennsylvania and in other states which may be organized. Such association will enable us to harmonize our distribution, to intensify our advertising, to complete our standardization, and do such other things as may be of mutual benefit.

The fruit growers in northern Ohio who have had close-up markets have done fairly well during the past two weeks. Without much package cost or transportation and storage charges, they were able to sell two years ago at a profit. Last year the freeze did not injure their crop materially. The southern Ohio growers, however, made no money two years ago and their crops were completely wiped out last year. However, there is complete optimism with regard to the future. They have taken their bumps and are still smiling. I am proud to be associated with such men, for the man who can smile when things are not going right is eminently worth while.

Mr. Fenstermacher: This talk has been most interesting. In marketing our fruit in the home markets we find them all right until the outsider comes in. Why can they come in and break our prices? They are doing it , and it is up to us to check it in some way. I believe the central marketing organization is the only way. If we only could control the retailer, but I guess the only way to do that is to hit him on the head with a club every time he charges somebody too much, but we can not do that. Not long ago I ran across a man who was formerly a clerk in a Baltimore store, but on account of ill health was compelled to go back to the farm. He had very early tomatoes last spring, and was getting $1.40 for a 20-quart basket from the stores. This worked fine the first few times, but later on he found he could not sell any more to one store. The store still had some, and could not use any more. The man said that this did not seem strange, because he had noticed that the store-keeper asked a lady 20 cents a quart for tomatoes which had cost him 7 cents a quart.

This is one of the big things we are up against. There are thousands of people who have never tasted an apple. The price is way beyond them, because of the hoggish retailer.

In my own town of Allentown, of 80,000, we do not have a public market, or farmers' market. The people are at the mercy of the commission men, who import stuff in the carload that might be grown at home. They in turn sell to the retailer, and the retailer to the consumer, and there is your high cost of living. We are living on goods shipped there. There are absolutely no market facilities. You may have the same situation in your own town. We tried to influence city council, and they say they must protect the retailers who pay licenses. They say they can not afford to let the farmers in, to build market houses and make things convenient for them, because the farmers do not pay any city taxes. They forget the 80,000 inhabitants in Allentown, who now are dependent upon the commission men for food, when by dealing with farmers they could get it at half the price. One thing about this is, that the merchants are noticing a falling off of country trade.

I really think we can sell all the produce grown in Pennsylvania right here. There is no necessity for getting it from Delaware or any other place. With our soil and climate we can grow any fruit worth having. The whole trouble is want of proper organization to make our influence felt. I thank God that I have lived to see the day that the influence of the farmer is beginning to be felt at Washington. Farmers are coming into their own, and I hope they will continue to do it. We don't need uplift committees and conferences; the farmer can help himself, if he is given the chance. More organization,

and then more of it, and the farmers will get there with their own efforts without help from anybody else. (Applause)

QUESTION BOX

Led by F. N. Fagan, State College, Pa.

Question: Would Scalecide, one to fifteen, kill Lecanium scale? Is there any danger from its use?

Professor Sanders: Not on a bright, clear day. Be sure to follow directions carefully.

Question: Is there any other preparation on the market other than Scalecide that I can use for this?

Prof. Sanders: Several miscible oils are on the market. You can also use homemade kerosene emulsion.

Question: What is the best way to eradicate Red Spider?

Prof. Sanders: Lime-sulphur one to forty, with eight pounds of sulphur added to a 100-gallon tank, and using four pounds of flour paste as a spreader.

Question: Can you kill Lecanium with lime-sulfur, dormant strength?

Prof Sanders: You can not get good results with lime-sulfur on Terrapin scale. A very careful study has been made of this by the U. S. Department of Agriculture, and they recommend the miscible oils. In Pennsylvania we have another scale which has been doing damage in certain peach and plum orchards. It is altogether a different Lecanium from the Terrapin scale, and can be killed by lime-sulfur, but the Terrapin scale overwinters as a half grown scale, and can not be killed by lime-sulfur. The other scale to which I refer winters over as a little larva. The Terrapin scale can be distinguished from the other scale mentioned because it is hemispherical in form and has dark radiating lines from the margin; the other scale is deep chestnut red, smooth and gobular.

Question: Can the Red Spider be controlled by dusting, and if so, when is the best time?

Prof. Sanders: Dusting is not effective under certain conditions. It requires frequent application. The best results can be obtained by dusting in the early morning when moisture is on the trees.

Question: When is the best time of year for the application?

Prof. Sanders: When you first see them.

Prof. Fagan: They may not show up until the middle of August or earlier. They are apt to come along any time with a bad infestation.

Question: Would you recommend stable manure costing about $5 a ton F. O. B. your station, to be used in a bearing young orchard.

Mr. Atkinson: We have used manure. One year we bought three car loads . We had to haul it three miles, and did it in the spring when the hauling was heavy, and from what I can see of the effect of manure on young trees, as compared with nitrate of soda, I would say it costs too much for what you get out of it. From our experience nitrate of soda was more economical, and it gave us better growth on the trees.

Question: Would you recommend bridge grafting on ten-year old Grimes Golden killed half away around by collar rot?

Answer: I would say, no. The tree is weak, and your graft is bound to be a little delicate and have a poor start. I do not believe it pays to bridge graft except in a few rare cases.

Member: I do not agree with that. About five years ago I found that my York Imperials were mice girdled. We had clover in the orchard. I bridge grafted those trees, and I only lost one, and that one was girdled too deep down in the roots. Those trees are nearly all healed over now, and have been doing well. It certainly paid me.

Question: How many grafts per tree?

Answer: It depends on the size of the tree. My trees are entirely healed over now. You could not tell if you went into the orchard that they were ever bridge grafted.

Member: We had about one hundred eight or ten year old trees girdled four years ago. Out of those we lost probably eight or ten. These failed from the blight, or something like blight, running up from the girdled spot, so that the grafts did not take hold.

Member: Mice are very bad in our section. We have some orchards on old farms, where the fence rows are not eliminated, and they make a harvest for mice and rabbits. In our orchard we paint every two years. For nine years we have used raw linseed oil and pure white lead, containing very little zinc, and in addition to that we leave our apple cuttings on the ground for the mice to feed on. We have never lost a tree from mice or rabbits. That is our record, and all around us people have lost heavily. We use raw linseed oil and the best white lead we can get. It costs about $60 every two years to paint our trees.

Question: How do you put it on?

Answer: We put it on with a varnish brush.

Prof. Fagan: There is danger in using impure white lead or boiled linseed oil. Use only raw oil. Personally I do not like it but if we could be sure of pure materials, we would have

no trouble. On the other hand, I have heard of men who have ruined their orchards, lost every tree.

Question: Would you recommend bridge grafting or painting?

Member: I believe grafting will save the trees rather than painting. I painted trees myself to my sorrow. I killed some trees. I have not had much mice injury, but I always try to have a certain amount of pruning done on each tree before there is any snow on the ground, and in the spring as the snow goes perhaps you will find those trimmings well barked, and the trees will not be touched. The mice seem to prefer the outside tender shoots to the coarse bark of the trunk.

Question: How much white lead and linseed oil?

Answer: Simply mix the two together until the mixture will not run down the tree. Make it as thick as you can apply it with a brush.

Question: Has anyone tried to kill mice with the new bacterial disease among them?

Prof. Fagan: We tried that for rats in barns. The rats got sick and got desperate for water, but they were very healthy rats, and they did not die. We did not get rid of them until we got a lot of cats, and now we have so many cats that we do not know what to do with them. But they are better than the rats. In fact, we often find the cats going through the orchards to find mice, and they are getting lots of them.

Question: How about peach trees. Can you use white lead on peach trees?

Answer: You can not use it on stone fruits. There should be a warning on this.

Member: We have used tarred paper, but another grower told us that if you have much wet weather it soaks up the tarred paper, and the acid will be injurious to apple trees. It sounds to me as though painting would be most profitable, but how about tarred paper?

Prof. Fagan: I do not know of anyone except Minnich Bros. who are using tarred paper. They are using it without any bad results.

Member: Would the white lead and linseed oil protect trees from borers?

Answer: I think it does.

Member: I know of an orchard up at Kislyn in Luzerne County, and the young trees in the orchard were wrapped with tar paper, and they went through the winter without injury. They had another orchard in which the trees were not wrapped and this orchard was full of borers. In the orchard in which the young trees were wrapped with tarred paper no borers were found and the block contained something like seven or eight thousand trees.

Prof. Fagan: It is a bad practice to let tarred paper stay on. It should be removed in the spring.

Question: What about planting peach trees in an apple orchard?

Prof. Fagan: That question has come up every year. If you have two fruits on the same land, give your best attention to the one you will have the longest. Give the apples the proper sprayings even if you do burn the peach foliage a little.

Question: How about growing apple trees in alfalfa sod without the use of fertilizer?

Mr. Chase: I am not in favor of that at all.

Mr. Pershing: What are we going to do about the Japanese beetle? It is down in the southeastern part of Pennsylvania, and I understand that the efforts to control it by the State and Federal Government are not wholly successful. Have they crossed over the river?

Prof. Sanders: Yes, they have crossed. We have about seventy square miles infested in Pennsylvania at the present time. The U. S. Government, Pennsylvania and New Jersey are spending about $130,000 a year studying the life history of this pest, and we have some of the best men in the country looking after it. The beetle is advancing a mile or two each year in spite of our best efforts, and it will continue to advance. We have more or less definite means of control by spraying, but the average spraying does not affect it. One of the most encouraging things that I have recently heard is, that one of our men, who was sent by the U. S. Department to Japan to study this beetle, wrote me that they had found and will send us parasites this spring. These will be released under proper conditions, and allowed to multify, and if we can secure a few thousand natural enemies to attack the beetle we will feel we have the question settled. It is another illustration of importing pests without their natural enemies. The great problem is the difficulty we are having in trees shipped here from abroad with moss or balls of earth about their roots. We are now experimenting to kill the pests that might be in the balls of earth.

Mr. O'Neil: Has anyone here had experience in controlling Apple Scab with dusting?

Mr. Hudson: We are not using dust on our apple trees. We do use sulphur dust on peach, but on apples I do not know of a grower in Maryland who is using dust. In 1919

many orchards were dusted, and we had a bad case of New Hampshire Fruit Spot and some Scab.

Question: What varieties of apples would it be advisable to plant on heavy, wet soil?

Member: Quinces would be better. Pears would do well. If the soil is packed together I would advise dynamiting it, when it is dry. That will help some. You can dynamite and do more damage than good if you do it when the soil is too wet.

Member: I would like to know whether there has been anything in this state in regard to spray service. In New York State they have established that service in several counties, particularly in reference to the second brood of the codling moth. We all want to know when to spray for the second brood. We take a chance, and do not always hit it. In New York the work is taken up by county agents. I am wondering if something of the kind could not be done in this state.

Prof. Hodgkiss: In our extension activities throughout the state some of the people, through the County Agents, have taken advantage of the Federal Weather Bureau to receive notification of the weather conditions. These agents have kept watch of the dates of spraying, and by telephone message, or some other way, have notified the growers in different districts of the right time to spray. In New York they have trained a man in a county who when he finds it is time to spray, calls up three different men, and tells them that now is the time to put on the delayed dormant spray. Those three men call up three other men. No man has more than three to report to, I believe, and in that way the information is distributed.

Our service which we started last year is similar to that. Unfortunately, we are not able at this time to put on a special man in each leading fruit county and we must depend on the county agent to look up that information as the fruit growers desire it.

Question: Is it wise to plant 3,000 Elberta peach trees in one block? There are other varieties of peach nearby.

Answer: I think a dozen peach growers would answer yes. They do not need cross pollenation to yield well.

Question: What has been the experience of peach growers of the relative value of Hale, Early Elberta, and Elberta, as far as the production of the fruit is concerned? How do they yield?

Answer: Hale is a light bearer, compared with Elberta, although we have only had forty trees. The Hale is superior to Elberta in quality.

Member: I read last week that with the Hale when the crop is light the size is enormous, but with a full crop they are not so large as the Elberta, and that the Elberta was a much more regular bearer and gave the best general peaches.

Member: It is a poor grower. What is meant by Early Elberta?

Answer: The Stark people claim to have an Early Elberta that is two weeks earlier than Elberta. Also, they claim it is superior to the old Elberta. It certainly seems to be ahead of the Eiberta. Of course, I should add that there is a premium on it.

Member: In our market if we have anything earlier than the Elberta it will crowd out the Belle of Georgia.

Member: I have an Early Stark Elberta, and planted it with the original Elberta, and this year both of the trees had peaches. The Elberta I picked before the Early Elberta. I believe I paid a little premium on that name "Early."

Member: I have had both Elberta and Early Elberta, and the Early is so near the ripening time of the other that there is little difference. It is a satisfactory peach, but no more satisfactory than the other. With reference to the Hale they make such beastly growth, that I don't want any more. The Early and the Elberta compared well in size. It is a free stone peach, but no freer than the old Elberta.

Prof. Anthony: The Federal Patent office at Washington is trying to work out a system of patenting varieties. That looks at first like a big thing. That will mean two things to us, first, it will mean that the man who wants to spend his time in breeding fruits, will have the possibility of patenting his new product and getting something out of it; and, second, that those nurserymen who really want to play a square game will have a chance to check up their varieties with the standard. We have to find some way of eliminating the uncertainty in varieties or the nurserymen's patronage is going to suffer. We are paying too much for mixtures in varieties.

Member: Our State Government could do much against this evil. As I understand it outside nurserymen are compelled to get a liscense to fill orders or sell trees in this state. I think before that license is granted, if there was one complaint made against that firm, they should not be given a license. We all have had trees substituted, and when they come to bear we have something other than we thought we had, and we have no redress. You can take it to court, but for a small number of trees, say one hundred and fifty, as I myself had, I would have nothing. I was urged strongly by

the New York authorities to push it, but it was a long distance from home (the firm was from New York State), and it was like sending good money after bad, because even if I had been able to recover it I would only have split about even. I have, however, lost seven years that I can not replace, and it seems to me that our State Department should be more severe in issuing the licenses.

Prof. Fagan: The National Nurserymen's Association is trying to kick out the crooked nurserymen.

Prof. Anthony: Dr. Shaw of the Massachusetts Station, who has been propagating fruit trees for many years decided that it was worth while to see if he could work out a means of identifying nursery trees. The men working about a nursery know the trees of the standard varieties without labels. A nurseryman brought up in the business does not have to look at the label. He knows his game, and the field man could prevent the mixture if the boss in the office would compel him to.

Dr. Shaw has a method of identifying nursery trees. This summer growers from all over the state brought trees and branches from trees which they knew the name of. They put him through a course, and he was somewhere around 96 or 97 per cent perfect in the identification of varieties from leaves and branches which he brought in. It begins to look as though we might be able to check up on the nurseryman. Dr. Shaw has been able to go to a nursery, go down the row, and issue a certification of verification that the variety was what the nurseryman said it was. We do not know just what will be the final outcome of this proposition but we see a ray of light on variety identification. The time may come when the nurseryman who does not sell true to name will find himself in great difficulty. Dr. Shaw's work was with apple, but I see no reason why it would not work out with other fruits.

There are many nursery companies which are trying hard to clear up this question of variety mixture. They are having trouble in their own organization. They need the support of the growers.

Question: We have a large block of sour cherries, about seven years old. After the crop is picked the leaves drop off. We bought a duster, and have used just what was advised, but still the leaves fall off. We want to know what to do next?

Answer: Spray with self-boiled lime-sulphur, one spraying, and you will control it all.

Member: At what time shall we do this?

Answer: You can hardly afford to wait until the cher-

ries are off. You will have to spray before they color up,—about the time the curculio first lays its eggs. One good spraying then with self-boiled lime-sulfur with arsenate of lead added will control them, and the mixture will be off the cherries before they go to market.

Question: How about the Niagara peach?

Prof. Fagan: It is very desirable, but it will not do in all sections.

Question: In planting 1,000 apple trees how many Stayman would you plant?

Answer: That depends upon where you are planting them. In my region I would plant 1,000, but it depends upon the section, and again on your market. We can grow Stayman better than any other variety of apple.

Prof. Fagan: You could not plant 1,000 Staymans in block without taking a chance on poor pollenation.

THURSDAY MORNING, JANUARY 26, 1922

Business Meeting

President Fenstermacher opened the meeting promptly at 9:30 A.M., by asking Secretary Hershey to read the section pretaining to the proposed amendment to the Constition:

Article 2. That the annual dues of the State Horticultural Association of Pennsylvania be $5.00 per year, and that only members in good and regular standing be admitted to meeting room."

President Fenstermacher: What action shall we take on this proposed amendment.

Mr. Chase: I move that the amendment be divided, and that the proposition to increase the dues to five dollars be first considered.

The motion was carried.

Mr. Fox: Is it necessary to change the dues? Are we getting low in our funds? I have been a member for forty years. I would like to know whether this increase in dues is really necessary before we act upon it. If you raise the dues to five dollars will you continue to meet in Harrisburg from year to year? If you change the meeting place you will increase membership without having to increase dues. If you come to Reading you will get more members. We always did. I myself think it will be a mistake to change the dues to five dollars. The dues were one dollar when this association was formed. A few years ago it was necessary to raise them to two dollars, and that was because of the condition of the treasury. If we knew what is the state of the

treasury we would know just how necessary this increase would be. We should hold to two dollars if it is at all possible.

Mr. Pershing: The matter must have been carefully considered before placing it before the society, and I would like to call on some one for the reasons for making this raise?

Mr. Chase: This question is a matter for sound judgment. As a life member, it is immaterial to me, but my judgment is that it would be a mistake to increase our annual membership fee to five dollars.

Mr. Fenstermacher: The chair proposes to recognize Mr. Schantz, our Membership Secretary.

Mr. Schantz: While taking the membership fees, it was surprising to note how many asked the question, "Are the dues still $2?" When we say that they are, they usually take a membership for a son, or manager, or somebody else interested. If the dues are increased, I believe we would get one member where we now get three. We have had a nice increase in membership and I feel that with everyone backing up the proposition to get members, we will have the same benefits to our treasury, and the results will be more members.

Mr. Debenham: Mr. President, being a new member, it seems to me that the increase of membership dues is a matter of finance. As a new member, and there are others in the same condition, I am in the dark as to the finances of the society. I believe that if the financial standing was stated we could consider the question with better judgment.

Dr. Fletcher: I was just about to ask for a membership statement and a financial statement before we consider this.

Mr. Fenstermacher here called on Mr. Edwin W. Thomas for his Report as Treasurer of the Society:

TREASURER'S REPORT

Edwin W. Thomas, Treasurer,
The State Horticultural Association of Pennsylvania.

RECEIPTS

Cash balance 1-26-1921	$608.66
12-31-1920—Interest on deposits, General account	6.58
2-26-1921—From D. Maurice Wertz, Prem. donated	8.00
2-26-1921—From M. S. McDowell, Refund of dues	10.00
3- 2-1921—From H. F. Hershey, sale of Apples	69.85
4-23-1921—From Interest on $100 Liberty Bond	2.12
4-28-1921—From Interest on $200 Lberty Bonds	4.26
8-13-1921—From H. A. Schantz, Membership Sec'y	538.00
9-28-1921—From Interest on $100 Liberty Bond	2.13

11- 3-1921—From Interest on $200 Liberty Bonds	4.24
12-31-1921—From Interest on deposits, General Acc't	13.43
1-21-1922—From Interest on Life membership fund	3.35
	1,270.62

DISBURSEMENTS

5-24-1921—To H. F. Hershey, Salary & Sundries	$149.00
8-11-1921—To H. A. Schantz, Postage	5.00
9- 8-1921—To The Sun Printing & Binding Co.	420.00
9-22-1921—To H. F. Hershey, Sundries	34.31
1-26-1922—To Cash on hand	662.31
	$1,270.62

AUDITOR'S REPORT

We, the undersigned Auditors, have examined the accounts, bills, and vouchers of the Treasurer of the Pennsylvania State Horticultural Association, Edwin W. Thomas and find the same correct. Showing the receipts to be $1,270.62, and the disbursements $608.31, leaving a balance in the Treasury of $662.31.

This does not include three $100 Liberty Bonds and $62.08 Life membership dues.

Respectfully submitted,

E. C. BOWERS,
JACOB L. RIFE,
E. F. PEIRCE,
Auditors.

REPORT OF MEMBERSHIP SECRETARY

H. A. Schantz, Allentown, Pa.

Received from Dues during year 1921		
Annual Memberships	$554.00	
Life Memberships	40.00	$594.00
Remittances forwarded to Edwin W. Thomas, Treas.		
August 9, 1921 (Annual)	538.00	
August 9, 1921 (Life)	40.00	
January 16, 1922 (Annual)	16.00	594.00
List of Members, January 1, 1922		
Life	151	
Annual	315	

(Of this number, 59 memberships are unpaid for year 1921)		466
List of members at last year's meeting		
Life	149	
Annual	185	
Total		334
INCREASE DURING YEAR, 1921		132

The reports were accepted by the Society on motion.

Member: In looking over the list of life members I find several who are deceased. Do we carry these along, or are they removed from the list when they have passed on.

Secretary: We remove them whenever we know of their deaths. If anybody knows of the death of any member, and has the names, I will have them removed from the list.

Mr. Fox: It used to be that the names of deceased members would be reported, and a Committee on Resolutions would be appointed, to offer Resolutions for those who had died the previous year. I have not lately gone over the list, but I can not fail to express my gratitude at the great increase of membership during this past year, an increase of 131 members. That is fine, and there is also a balance in the Treasury of $632.31. We are surely in fine shape, and certainly we should not increase the dues.

Mr. Tyson: I want to ask for some approval of the work of our Membership Secretary. I realize the work that the Secretary has to go through to accomplish such an increase of membership, such as we have had, and I think he deserves a vote of thanks from the society.

Mr. Fenstermacher: Mr. Tyson moves that a rising vote of thanks be given to Mr. Schantz for his excellent work in increasing the membership.

Motion passed the society.

Mr. Schantz: I certainly appreciate it. I wish to tell just how I did it. I wrote to the State Department and secured a list of fruit growers of the state, and sent them each a circular, and in that way we secured a great number of members. I expect to follow that plan up next year through the county agents as well, getting a list from them too, and see whether we can secure another additional hundred during the coming year. I have other things in mind also, and I hope by next year that we will have still more of a showing.

Mr. Fenstermacher: The motion concerning increase of dues is still before the society.

Mr. Walton: I had something to say on that subject a year ago, but by the turn the membership has taken, I have

nothing to say for it. I am quite willing to have the dues stay as they are.

Member: I move that we strike off the proposed amendment, or part of it pertaining to increase of dues.

Mr. Peirce: I second that.

The motion carried.

Mr. Fenstermacher: We will now take up the second part of the amendment, concerning not permitting anyone but members to attend the meetings.

Mr. Chase: A few years ago, at York, there was an amendment to the By-laws that only members in good standing should be admitted to the meetings. I believe that was carried, and if so, I would like to have it read. If it stands as an amendment already, I can see no reason for taking any further action.

Mr. Hershey here read Article 6 of the Constitution—"The regular meetings of the Association shall be closed to all persons, except paid-up members of the Association, speakers, delegates from associations outside of Pennsylvania, all ladies, and the minor sons of members."

This being already a part of the Constitution, the amendment was not considered further.

Mr. Fenstermacher: The reason the provisions of the Constitution just referred to were never complied with, is because we are under obligation to the State Department of Agriculture. They pay the rent and the expenses of some of the speakers, and thus we can not enforce that part of the Constitution.

Mr. Bowers: I would much rather see the meeting thrown open to all, and I believe we would get members by allowing everyone to come in.

REPORT OF THE LEGISLATIVE COMMITTEE

Only one matter has come before the Committee—that of securing a State appropriation for the Association, as proposed at the last annual meeting. The Committee met with the Secretary of Agriculture last winter, when the Legislature was in session, and went over the situation thoroughly. It developed that none of the moneys of the State Department of Agriculture can legally be expended for this purpose, unless so specified by the Legislature, not even for the printing of the Proceedings. The sentiment of the Legislature was sounded, and found to be unfavorable; a similar request made by the State Poultry Association failed to receive favorable action. It is the judgment of the Secretary of Agriculture, and of the Committee, that it is unwise to press the matter of a State appropriation, in view of the distinct opposition on

Capitol Hill to State aid for any of the State Agricultural Societies. It is evident that, for the present at least, such additional revenue as the Association may need for expanding its work, must come from the members themselves; and particularly, in the opinion of the Committee, by increasing the number of members.

Committee: C. J. Tyson, H. C. Brinton, S. W. Fletcher.

The above report was accepted by the Society on Motion.

Report of Exhibition Committee: We report 124 plates of apples, 29 boxes, 17 barrels, and 2 baskets on exhibition. This is considered a good showing, considering conditions in the state.

F. N. Fagan, Chairman. E. Bane Snyder.

REPORT OF THE RESOLUTIONS COMMITTEE

1. The Association records with deep regret the death of one of its oldest members, and of two of its most active members: Abner Hoopes of West Chester, a man of remarkably high character, was long a successful nurseryman, and a valued friend of this Association through its early years. D. N. Minnick of Chambersburg, was a practical and successful grower, whose experience and advice was always at the service of our members. John P. Stewart of York, formerly of State College, as an experimenter and investigator, contributed to the advancement of the horticulture of Pennsylvania, and to the development of the Association.

BE IT RESOLVED, that our Secretary be directed to convey to the relatives of these former members the deep sympathy of the Association and our recognition of their services to Horticulture.

2. WHEREAS, the peach industry in many counties in this state is seriously threatened by losses due to peach yellows; and

WHEREAS, the assistance given by the State Bureau of Plant Industry to the growers last year in detecting the presence of diseased trees has proved of great benefit;

Therefore BE IT RESOLVED, that this Association, through its Secretary, request the Secretary of Agriculture to continue the investigations of this disease and to extend, as far as is possible, the inspection service to mark and destroy infected peach trees.

3. The enjoyment of our meetings would be much increased, and our health less seriously threatened if they could be held in a smaller hall, and one adequately heated;

BE IT RESOLVED, that our Secretary be requested to do everything in his power to secure a suitable meeting hall for next year's sessions.

4. RESOLVED, That the Association strongly approve the Vestal Bill, H. R. 7102, providing for the establishment of standard fruit and vegetable packages, and

RESOLVED, further, that a copy of this resolution shall be forwarded to the Chairman of the proper Committee at Washington.

5. WHEREAS, our Constitution, according to Article No. 3, reads—"No president shall serve for more than two consecutive years," and

WHEREAS, it is not always for the best interest of this Association to change executive officers so often; Therefore, be it resolved that Article No. 3 be amended so as to read "A President can be re-elected as often as the organization sees fit."

6. WHEREAS, There is a commendable general movement for the development of A Greater State College, and as the College has done and is doing a great work for our citizens in all lines of Agriculture;

Therefore, BE IT RESOLVED: That we approve plans for the greatest possible development and usefulness of the Pennsylvania State College, and offer such co-operation from this Association as is possible; and

BE IT FURTHER RESOLVED: That a copy of this Resolution be sent to Dr. Thomas, President of State College, for his support and use.

For the Committee, R. D. Anthony, Chairman.

Mr. O'Neil: I have a motion to put before this body, but before making it, I would like to say a few explanatory words.

The Pennsylvania Fruit Packing & Sales Co., a body of fruit growers with many acres of trees, near Norristown and Collegeville, incorporated for the primary purpose of uniform and centralized grading and selling, has authorized me to speak here today for its members.

Several years ago, Professor Nixon was assigned to solve the question of potato blight, its cure and, if possible, its prevention. This he has done. The thought suggested itself to us, why not have Professor Nixon assigned to solving the problem of blight on fruit trees. If this work be put in his hands, with no other work to interfere with his efforts, we think it would be solved.

I, therefore, move, Mr. President, that a Committee of which you shall be Chairman be appointed by you now, and that this Committee be authorized to interview the President of the State College, Dr. Thomas, that it explain to Mr.

Thomas the importance of blight control or prevention on fruit trees, and request him in the name of the State Horticultural Association of Pennsylvania to assign Professor Nixon to this work.

The Resolutions were adopted, laying on the table for action next year the one referring to an Amendment in the Constitution concerning re-election of Presidents.

Report of the Nominating Comimttee: President, Dr. S. W. Fletcher, State College, Pa.; First Vice-President, C. Arthur Greist, Guernsey, Pa.; Second Vice President, H. C. Brinton, Hanover, Pa.; Third Vice Preseident, W. H. Weinschenk, New Castle, Pa.; Secretary, H. F. Hershey, Hamburg, Pa.; Treasurer, Ed. W. Thomas, King of Prussia, Pa.

Committee: Robert J. Walton, W. S. Adams, F. S. Dickenshied, S. H. Wertz.

The nominees were unanimously elected and the Secretary was instructed to cast the ballot.

Mr. Fenstermacher here called Dr. Fletcher to the chair, to preside.

Dr. Fletcher: No man can be insensible to the honor of being asked to preside over this body. This is the Sixty-third Annual Meeting. Without minimizing the services of other organizations, I think we are perfectly safe in saying that this Association has done more to develop horticulture in the state than all others. As it has been in the past so we hope it will be in the future, and to that end we seek the hearty co-operation of everybody."

REPORT OF THE GENERAL FRUIT COMMITTEE*

By S. W. Fletcher*

The outstanding feature of the year 1921 was the almost unprecedented loss of the fruit crop by spring freezes. Seldom, if ever, has the damage been so serious, or so widespread. Pennsylvania growers suffered less than their neighbors in New Jersey, Maryland, Virginia and Ohio, but they were hit badly enough. There have been total failures before in certain counties, but no such state wide failure is on record in the thirty or more years of modern commercial fruit growing in this state. It is not likely to occur again in a generation. Coming immediately after a year of good crops, but of rather poor prices, when most growers barely broke even, it fell with crushing force, especially in the wholesale counties. Here and there over the state are orchards that, through some favoring circumstances, either of location or of care, escaped serious loss; but fully 90% of our growers have had a very lean year.

The damage was caused by freezes, or general and prolonged low temperature, not by local frosts. Some rochards were frozen in the bud on the nights of February 20 and February 21. Others were killed by the "Easter freeze" of March 28 when the temperature dropped to 20 degrees in many places, accompanied by a high wind. This had been preceded by unseasonable warm weather, which had swelled the buds. Another freeze, on April 11, completed the work of destruction in many orchards. It is interesting to observe that in some orchards peaches escaped with only slight damage, while apples were almost all killed. This was due to the difference in blooming season; the peaches were not at the period when most sensitive to cold and the apples were.

*This report is a summary of the replies received from a letter of inquiry addressed to 115 fruit growers in 33 counties. The co-operation of these growers is gratefully acknowledged.

WHY SOME ORCHARDS ESCAPED THE FREEZE

To some extent this was a "test season" for locations and for cultural efficiency. For the most part, the several freezes took orchards high and low, in good culture or poor, with strict impartiality; but there were a number of exemptions that can be explained only on the basis of favoring conditions. The severity of the damage, especially by the later freezes, depended to a large extent on the stage of development of the blossoms. A large part of the so-called "hardiness" of certain varieties, as reported by growers, simply means that on their farms these varieties were not at the period most sensitive to cold—the fertilization period—when the freeze came. A difference in the time of blooming of only one or two days makes an appreciable difference in susceptibility to injury by cold.

Any factors, that either hastened or retarded the development of the blossoms of a variety helped to secure partial immunity. Thus, in some sections, orchards on elevated sites and on northern exposures suffered less than orchards of the same varieties on lower land and of southern exposures. In other districts this was exactly reversed:—the low lying orchards, especially those on heavy land, which delayed blossoming, or those in narrow valleys subject to fog, escaped with less injury than the high orchards. In Franklin County, low lying orchards in the center of the Valley suffered less than orchards on the slopes of either North or South Mountain. The value of proximity to the lake, in tempering local climate and thus securing partial immunity from frosts and

freezes, was again demonstrated in a striking manner in Erie County. Almost without exception, old trees suffered less than young trees of the same variety. James F. Walker, of Chester County, reports that old trees were damaged 55% and eight year old trees of the same variety 98%.

WINDBREAKS

The value of a windbreak was clearly shown in the spring of 1921. The several freezes were accompanied by high north and northwest winds. Orchards in sheltered sites, or protected by a strip of native woodland, suffered least, as a rule. On the farm of John C. Schmidt, of York County, "An orchard with a northern exposure and protected by woods on the west had a full crop." Howard Anderson, of the same County, says, "The thickest orchards had the most fruit and those protected froom the full sweep of the north wind." Professor H. A. Surface, of Snyder County, reports: "Many trees protected by hills, woods or buildings, or in towns, produced well. Near the river this was especially noticeable, especially for the peach." Heretofore very little attention has been given to windbreaks in Pennsylvania. They confer other benefits besides giving partial protection from cold winds. It is evident that occasionally it will be desirable to plant artificial windbreaks, and that always it is wise to take advantage of the natural shelter of hill or woods.

As a rule, the freeze took well-cared-for and neglected orchards impartially, yet it must be admitted that there is considerable evidence that old Boreas was a little more lenient to the former. It is perhaps natural that those who had a crop last year should prefer to attribute it to good management rather than to location; it is a human trait to claim the credit for success due mainly to natural conditions. The evidence seems quite clear, however, that in some cases at least partial immunity was the result of good care the season previous, especially as to spraying and either fertilizing or its equivalent, tillage, so that the fruit buds were well nourished. According to a Lancaster County grower, "The orchards that had been heavily fertilized and well sprayed fared better." Willis A. Hess, of Franklin County, who had a good crop in 1921, "feels that the application of nitrate of soda before the bloom opened boosted the buds and helped some." However that may be, the rewards of good culture are adequate, even without this possible additional benefit.

Following are the reports of representative growers. While it is impossible to assign different degrees of hardiness to different varieties, owing to variation in their blooming season in cultural conditions, yet it is apparent that Rome, York

and Spy, being late bloomers, were hurt least, while varieties of the Winesap group, such as Stayman, Black Twig of Paragon, and Winesap, suffered most severely. The well known weakness of Elberta—lack of hardiness—is also brought out in these reports.

DAMAGE TO APPLE CROP BY THE SPRING FREEZE, 1921

County	Per cent Damage	Varieties injured least
Adams	80-95	Rome, York, Grimes, Pewaukee.
Allegheny	90	Baldwin, N. Spy, Transparent, Rambo, (25% of crop).
Armstrong	75	Transparent, Wealthy, Jonathan, Rome, Golden Gate.
Bedford	95-99	None escaped.
Beaver	60-75	Baldwin, Grimes, Delicious, Rome, Golden Delicious, Walbridge. The varieties frozen worst were Hubbardston, R. I. Greening and Gravenstein.
Berks	80-99	Rome, Wealthy, Jonathan, King David, York, Delicious, Smith Cider. Peaches damaged 85%; Arp Beauty, Smock and Iron Mountain least injured.
Blair	65-100	Rome, York, Rambo, York Stripe.
Bucks	75-90	Rome least, Stayman most. Peaches 90-100% —Iron Mountain least.
Butler	15	Jonathhan, Wagener, Grimes, Baldwin; injury confined mostly to early sorts.
Chester	85-100	Smith Cider, Porter, York, Jeniton, Rome, Jonathan. Peaches, cherries and plums 100% killed.
Clearfield	80-90	York, Jonathan, Spy.
Columbia	90-99	Spy, about 25% of crop of Salway, Georgia Belle and Carman peaches.
Cumberland	95-100	Smith Cider, Baldwin, Y. Transparent, York.
Dauphin	80	Wealthy, Baldwin, Spy and Grimes. Peaches 60% damaged, Salway and Captain Ede least.
Erie	20-50	Grapes damaged 75%; peaches 50% plums, 100%; cherries, 90% (Morello little hurt); pears, 75%.
Franklin	75-100	A few Yorks and Staymans, Winesap and Rome on old trees.

Huntingdon	100	No varieties of apples or peaches escaped.
Lackawanna	95	Wealthy, Smokehouse. A fair crop of peaches.
Lancaster	65-95	Grimes, Wealthy, McIntosh apples; Iron Mountain Carman, Champion, Salway peaches.
Lebanon	90-95	Wealthy, Dutchess, Northwestern Greening, Pewaukee, Red Astrechan, Rome; Champion, Iron Mountain, Brackett and Greenboro peaches; plums and cherries all killed.
Lehigh	50	Smith Cider.
Luzerne	95-100	Some peaches.
Lycoming	85-98	Wagener, Rome, Wealthy, Spy, Maiden Blush, Y. Transparent, Duchess apples; Hill's Chili and Carmen peaches. Peaches injured 95%; Grapes, 10%.
Monroe	95	Jonathan.
Montgomery	98	Light crop on old trees.
Perry	98	Other fruits 100% killed.
Snyder	40-99	Wealthy, Summer Rambo, Y. Transparent.
Somerset	100	
Washington	90	
Wayne	99	
Westmoreland	90-95	Wealthy Rome, Wagoner, Ben Davis, York. Full crop of Carman and Belle Georgia peaches, one half crop of Elberta.
York	85-95	Rome, York, Delicious, Stayman.

Cost of Production. The small crop made the cost of production, per bushel, higher even than in 1920, but the price of labor was reduced from 10 to 100% as compared with 1920, averaging about 30% for the state; and the cost of supplies averaged nearly 20% reduction. The fact that the selling price of fruit was from 50 to 300% higher in different counties, averaging about 75% increase, did not help the man who had no fruit to sell, but it did help the man who had a partial crop. Out of the 115 growers reporting, only eleven said they had had a successful season. Representative reports are given herewith:

COST OF PRODUCTION AND SELLING PRICE, 1921.

County	Cost of labor and supplies as compared with 1920	Selling Price as compared with 1920	Was it a successful year?
Adams	25% less	25% higher	No
Adams	30% less	75% higher	No
Adams	30% less	50% higher	No
Allegheny	Same	20% higher	No
Armstrong	Same, but more labor	35% higher	Yes
Armstrong	about as high as1920	75% higher	No
Bedford	(Labor 65% of 1920 Supplies 80% less Packages 50% less	250% higher	No
Beaver	Wages 40% less	100% higher	No
Beaver	20% less	40% higher	Fairly
Berks	Labor,Same, spray material and baskets higher	Somewhat higher	Fairly
Berks	About the same	100% higher	No
Berks	Labor 20% less, supplies 10%.	150-200% higher	No
Berks	Practically same		No
Berks	Labor higher, supplies 10% less	30% higher	No
Blair	20% less	75% higher	No
Blair	10% less		No
Blair	About the same	About the same	No
Blair	18% less	100% higher	No
Bucks	Labor 50% less		No
Butler	About the same	50% higher	No
Butler	Labor same, supplies much lower	50% higher	No
Chester	Slightly lower labor 40% lower supplies same	Much higher	No
Chester	15% lower	75% higher	No
	Labor same, supplies cheaper		No
Clearfield	About the same	Higher	No
Columbia	About the same	100% higher	No
Columbia	About the same	100% higher	No
Cumberland	Labor 33% less, barrels 50% less	100% higher	No
Cumberland	50% less		No
Dauphin	30% less	80% higher	No
Erie (mostly on grapes)	About the same	100% higher	Yes
Erie	20% less	20% less	No

Erie	Labor same, supplies 10-25% lower	Higher	Yes
Erie	Labor 30% less, supplies 40% less	Apples 300% more Grapes same	Yes
Erie	Labor 20% less, supplies 20% more	About same	Yes
Franklin	Labor 100% less		No
Franklin	33% less	Same as 1920	Yes
Franklin	Labor 30% less; supplies 40% less		No
Franklin	Labor 50% less; supplies 20% less		No
Franklin	40% less	100% more	Very good
Huntingdon	Labor 50% less	200% more	No
Lackawanna	30% less	Higher	No
Lackawanna	30% less	Higher	No
Lancaster	25% less	300% higher	No
Lancaster	Higher	200% higher	Yes
Lancaster	20% lower	200% higher	No
Lancaster	25% lower	100% higher	No
Lehigh	Same as 1920	Higher	Yes
Luzerne	30% lower	100% higher	No
Lycoming	Labor 33% less, supplies 8% less	100% higher	Yes
Lycoming	Same as 1920	100% higher	No
Lycoming	Same as 1920	100% higher	Yese
Monroe			No
Montgomery			No
Perry	Labor 25% less		No
Perry	Labor 25% less		No
Snyder	Same as 1920	100% higher	No
Snyder	Much less	300% higher	
Washington	Less	200% higher	No
Wayne	Lower	Higher	No
Westmoreland	Labor 50% less, supplies same as 1920	Higher	No
Wyoming	10% lower	400% higher	Yes
Wyoming	Labor 15% less; supplies 25% less	Much higher	Fairly
Wyoming	Same as 1920	100% higher	No
Wyoming	Same as 1920	100% higher	No
York	25% less	33% more	No
York	30% less	100% more	No
York	Labor 100% less; supplies 40% less	30-40% more	No
York	40% less	150% more	No

New Planting. Orchard planting is practically at a standstill in Pennsylvania. Only Berks and Franklin Counties report any considerable planting in 1921. Last spring this was due to the very high prices of nursery stock, and to a season that was rather unfavorable, taking the state as a whole. This coming spring nursery stock will be within reach, in price, and it remains to be seen whether growers will prove their faith by their works. The 1920 census returns in the United States show a decrease of 23.8% in the total number of bearing apple trees and a decrease of 45% in the number of young apple trees, as compared with 1910; also a decrease of 37.5% in the number of bearing peach trees, and of 48.8% in the number of young peach trees in the country. Pennsylvania lost a million apple trees between 1910 and 1920, mostly from the old farm orchards. All over the state farmers who once were apple producers, but whose neglected orchards have died, are beginning to go to the commercial apple grower for fruit. These signs of the times ought to be comforting to the men who are pursued by the spectre of over-production.

Varieties. The outstanding feature of the variety recommendations by growers here reported is the rapidly increasing importance of the Stayman, which was practically unknown in Pennsylvania fifteen years ago. It is listed as a standard sort in twenty-two of the thirty-three counties represented. Ten years from now it will be the premier Pennsylvania apple. Rome Beauty, also, is constantly gaining in favor, especially after a season like 1921, when this variety came through the freeze better than any other sort, taking the state over, doubtless because of its late blossoming season. 1921 also brought added laurels for the York and showed that in the southern part of the state, at least, it will be well to think twice before discarding this old standby in favor of some of the newer varieties.

I regret to report that our old friend, the Baldwin, is failing rapidly. Once the king of fruits in Pennsylvania, it is now being displaced by the Stayman, McIntosh and several other sorts, even where it is at its best, in northern and western Pennsylvania. The severe winter of 1917-1918 gave it a sharp set-back; some trees were killed outright and many more had their lower branches killed. Added to this is the trouble with Baldwin Spot, or Bitter Pit, which was especially bad this season, causing a loss of thousands of dollars, especially on fruit in common storage. Baldwin will continue to be a favorite in northern and western Pennsylvania but it has lost its grip, and now yields first place in the pomology of the state to Stayman. The Baldwin has been our mainstay for a century; there are many who regret to see it superceded by younger and more virile competitors.

The passing of the Ben Davis, also, is witnessed by the fact that it is recommended in but two counties; fifteen years ago

it would have been recommended in a dozen counties. It is a shipping variety and has no place in the fruit list of a state that grows apples chiefly for local markets and hence must have sorts that are fit to eat. Peace to its ashes; we let it go without regret. Delicious is making new friends every year; it is recommended in fourteen of the thirty-three counties represented. Notwithstanding its defects, such as marked susceptibility to scab, a tendency to mould at the core, a loss of flavor or "flattening out" in cold storage, and sometimes lack of size, it has proved to be a vigorous, hardy, early bearing, and productive variety of high quality and seems to be especially valuable for keeping in common storage for local markets.

It is significant of the trend toward standardization of varieties that the list recommended for planting by these 115 growers from all over the state includes only thirty-three varieties of apples and twenty-four varieties of peaches, as follows: **Apples:** Baldwin, Ben Davis, Delicious, Duchess Fallwater, Hubbardston, Gano, Grimes, Jonathan, King, King David, Maiden Blush, McIntosh, Paragon, Rambo, Red Astrachan, R. I. Greening, Rome, Roxbury Russet, Smokehouse, Spy, Stayman, Stark, Summer Rambo, Twenty Ounce, Wagener, Winter Banana, Wolf River, York, Yellow Bellflower, Yellow Transparent. **Peaches:** Admiral Dewey, Belle of Georgia, Brackett, Captain Ede, Carman, Champion, Chair's Choice, Crosby, Elberta, Early Elberta, Fox, Greensboro, Hale, Hiley, Hill's Chili, Iron Mountain, Late Crawford, Mayflower, Mountain Rose, Rochester, Salway, Slappy, Smock, Wonderful. Fifteen years ago the list would have been twice as long. Fifty years ago, it would have been five times as long, as is evidenced by the multitude of sorts found in our old orchards. In fact, the standardization of varieties, in response to commercial demand, has proceeded even further than appears from this list. It is a fair estimate that at least seventy-five per cent of the commercial apple planting in Pennsylvania under twenty-five years old is of twelve standard sorts: Baldwin, Grimes, Jonathan, McIntosh, Rome, Spy, Stayman, Stark, Wealthy, York, Smokehouse, Yellow Transparent; and that at least seventy-five per cent of the commercial peach planting is of eight standard sorts: Belle of Georgia, Carman, Elberta, Greensboro, Hiley, Iron Mountain, Salway, Smock.

The reduction in the number of varieties for commercial planting has proceeded as far as it ought to go in Pennsylvania. The great diversity of cultural conditions in different parts of the state and the different preferences of our numerous local markets, make it desirable to plant more of varieties that are of distinct local adaptation, and less of the

great cosmopolitan sorts, that are most satisfactory in the wholesale districts. We need more really good varieties, instead of fewer, in our local market fruit growing.

Following are the variety recommendations of growers:

VARIETIES OF APPLES AND PEACHES RECOMMENDED BY GROWERS FOR COMMERCIAL PLANTING, BY COUNTIES

Adams	York, Rome, Stayman, Grimes. **Peaches:** Elberta.
Allegheny	Transparent, Duchess, Maiden Blush, Baldwin, Rambo, Stark, Rome, Wolf River, York, Delicious (?).
Armstrong	Transparent, Wealthy, Rome, Jonathan, Baldwin, Spy, York.
Bedford	Stayman, Delicious, Grimes, Gano, York, Transparent, Wealthy, Rome, Baldwin, Winter Banana, Stark.
Beaver	Transparent, Rome, Grimes, Jonathan, Summer Rambo, Stayman, McIntosh, Baldwin. **Peaches:** Elberta, Hale.
Berks	Grimes (double-worked), Stayman, Jonathan, Rome, Delicious, Smokehouse, Hubbardston, Stark, Wealthy, Yellow Transparent, Duchess, **Peaches:** Elberta, Hiley, Belle of Georgia, Carman, Early Elberta, Iron Mountain, Hale, Brackett, Salway, Slappy.
Blair	Stayman, Rome, Baldwin, York, Spy, Delicious, Smokehouse, Summer Rambo, Winter Banana, Stark. **Peaches:** Elberta, Hale, Belle of Georgia, Salway.
Bucks	Stayman, Grimes, Smokehouse, Paragon, Yellow Transparent, Wealthy, Duchess, Rome. **Peaches:** Hiley, Elberta, Belle of Georgia, Iron Mountain, Rochester.
Butler	Stayman, Jonathan, Baldwin, Spy, Yellow Transparent, Wealthy, Grimes, Delicious, York.
Chester	Wealthy, Smokehouse, Jonathan, Rome, Stayman, Grimes, Delicious, Yellow Transparent. **Peaches:** Carman, Belle of Georgia, Elberta, Fox, Captain Ede, Greensboro.
Clearfield	Rome, Spy, McIntosh, Wagener, Williams Red.
Columbia	Rome, Stayman, Delicious, Spy, Smokehouse, Stark, Baldwin, Ben Davis, Smith Cider.
Cumberland	York, Stayman, Grimes, Rome, Ben Davis.

Dauphin	Duchess, Wagener, Summer Rambo, Grimes, Stayman, Winter Banana, Baldwin, Stark, York. **Peaches:** Carman, Belle of Georgia, Elberta, Iron Mountain, Salway.
Erie	Spy, Baldwin, King, R. I. Greening, Red Astrachan, Yellow Transparent, Maiden Blush, Rome, Dutchess, Wealthy, McIntosh. **Peaches:** Greensboro, Admiral, Dewey, Carman, Rochester, Mt. Rose, Elberta, Crosby, Hill's Chili.
Franklin	Stayman, Grimes, Rome, York, Delicious, McIntosh, Wealthy, Jonathan. **Peaches:** Elberta, Belle of Georgia, Salway, Late Crawford.
Huntingdon	Stayman, Rome, York, Grimes, Wealthy, Yellow Transparent. **Peaches:** Elberta, Belle of Georgia, Carman.
Lackawanna	McIntosh, Baldwin, Spy, Stark, Wagner, Wealthy, Rome, Jonathan, Smokehouse.
Lancaster	Grimes (top-worked), Smokehouse, Jonathan, Stayman, York, King David, Wealthy, Yellow Transparent, McIntosh, Stark, Duchess, Delicious, Paragon. **Peaches:** Mayflower, Greensboro, Carman, Champion, Belle of Georgia, Elberta, Hale, Fox, Smock, Iron Mountain, Salway.
Lebanon	Yellow Transparent, Duchess, Wealthy, Smokehouse, Delicious, Rome, Stayman, Paragon. **Peaches:** Mayflower, Greensboro, Carman, Champion, Belle of Georgia, Elberta, Hale, Brackett, Chair Choice, Captain Ede, Fox, Smock, Iron Mountain, Salway.
Lehigh	Stayman, Jonathan, Rome, Delicious.
Luzerne	Spy, Baldwin, King, Fallwater, Stark, Twenty Ounce, Wagener, Rhode Island Greening, Yellow Transparent, McIntosh, Red Astrachan, Roxbury Russet.
Lycoming	Spy Rhode Island Greening, McIntosh, Stark, Rome, Jonathan, Baldwin, Wagener, Delicious. **Peaches:** Carman, Elberta.
Monroe	Baldwin, Rhode Island, Greening, McIntosh, York, Yellow Bellflower.
Montgomery	Stayman, Jonathan, York. Yellow Transparent. **Peaches:** Belle of Georgia, Elberta.
Perry	York, Stayman, Rome, Stark.
Snyder	Stayman, Rome, Smokehouse, Summer Rambo, Delicious, Wealthy, Yellow Transparent, King. **Peaches:** Elberta, Smock, Iron Mountain, Wonderful, Hiley, Belle of Georgia.

Somerset	Smokehouse, Rome.
Washington	Baldwin.
Wayne	Baldwin, Rhode Island, Greening, Northern Spy, Stayman.
Westmoreland	Yellow Transparent, Wealthy, Baldwin. **Peaches:** Elberta.
Wyoming	Rome, Stayman, Spy, Wealthy.
York	Stayman, York, Wealthy, Smokehouse, Summer Rambo, Duchess, Yellow Transparent, Jonathan, Delicious, Grimes, Rome, McIntosh. **Peaches:** Elberta, Carman, Belle of Georgia, Late Crawford, Hiley, Salway.

Because of the short crop there is very little additional evidence on new or little known varieties. W. H. Amlser, of Beaver County, says: "My experience with Golden Delicious convinces me that it will be the leading yellow Winter apple. It is a strong grower, early bearer, keep longer in an ordinary cellar than the Grimes, and is fully as good in quality." On the other hand, H. L. Breidenbach, of Berks County, states, "Golden Delicious bore on two year old grafts. Fruit ran very small. Quality fair. Possibly it has a longer season than Grimes, but I cannot see that it has the commercial value of the latter, in this section where Grimes does well." The Senator and Magnate apples are considered promising for the southeastern counties. The J. H. Hale peach seems to have maintained its reputation for fickleness; A. J. Freed, of Beaver County, reports it "the best seller of them all;" but H. L. Breidenbach, of Berks County, says "J. H. Hale ran very uneven on my trees this year." Peter R. Boltz, of Lebanon County, is favorably impressed with the President Drouard pear, and says the Shiro is "by far the best and most profitable Japanese plum." According to A. E. Reist, of Lebanon County, "Captain Ede bears earlier and more regularly than Elberta, and has the highest flavor."

Insects and Diseases. The season was productive of a bountiful crop of pests, if not of fruit. The per cent of damage was even higher than usual, for two reasons: the small crop, which reduced the feeding area; and the short sighted policy of many growers, who did not spray at all , or only in a half hearted way, when faced with the loss of the crop. These men will pay dearly for their negligence this season. because of under nourished fruit buds which will not set fruit well, and a greater horde of pests to fight.

Peach yellows, which looked very threatening a few years ago, is now being brought under control largely through the energetic campaign of inspection inaugurated by the State Bureau of Plant Industry. The apple curculio seems to be on the increase; several growers have found it necessary to give

additional sprays of lead arsenate for this pest. A number report that the San Jose scale, which seemed to be almost extinct in some counties a few years ago, is again a menace. The psylla, which has nearly ruined the pear industry in Western New York, is reported from several northern counties and from Chester County. Wolly aphis on the roots has caused serious loss to a young orchard in Dauphin County.

Dusting. There does not seem to be a disposition to abandon spraying in favor of dusting. The experience of growers is that dusting may be even superior to spraying for the summer treatment of peaches, and may be useful as a supplement to spraying in the summer treatment of large apple orchards, especially the petal-fall treatment; but few care to go beyond that at present. Following are representative comments on dusting:

"Have used dust on apples almost exclusively for several years, and last year exclusively. I find my orchard is steadily slipping back and will use nothing but liquid spray this year," J. W. Prickett, Adams County.

"I would dust peaches instead of spraying, but would use dust on apples only to supplement spraying." W. E. Grove, Adams County.

"Dust for brown rot on peach and codling moth on apple after petals fall," E. R. Johnson, Bucks County.

"We use dust to control brown rot and curculio in interplanted blocks of peaches and apples and find very satisfactory control of apple troubles in these blocks, using only the peach dust mixture for the apples," Guy L. Hayman, Chester County.

"Dusting was a complete failure in most cases owing to dry weather. Absolutely no dews for months. Dusting with sulphur cleaned up red spider on prunes when trees were damp," H. S. Loop, Erie County.

"Dusting will not live long as an apple treatment," R. J. Gillan, Franklin County.

"Dusting took a good many leaves. I would not recommend it until further trial," A. E. Reist, Lebanon County.

"I would dust in an apple orchard with peach fillers because summer fungous sprays for apples always injure the interplanted peaches," L. H. Crossman, Montgomery County.

"We dust almost entirely as a summer treatment for apples. So far it is very satisfactory," Sharon Fruit Farm, Perry County.

"The petal-fall treatment on apples gives better results with dust than with spray," F. H. Fassett, Wyoming County.

"We dust only on hillside orchards where it would be impossible to use a sprayer," L. M. Myers, York County.

"I use my duster only in case of an emergency, when rapid treatment is necessary," Howard Anderson, York County.

"Our only experience with dusting apples was disastrous. It did not control curculio, scab or sooty blotch. Scab nearly defoliated the dusted trees. It did control codling moth, and might be used to help out spraying for this insect at a hurry up time. Dusting however, was very successful for the summer treatment of peaches and apricots," F. H. Rohlfing, Dauphin County.

Co-operation in Buying and Selling: The close proximity of most of our orchards to good markets favors individual rather than co-operative effort, especially in selling. As one grower puts it, "There is not much incentive to co-operation when we are so close to markets where almost any grade of fruit finds a ready sale at good prices." In our wholesale counties, however, the need of co-operation among growers is becoming more and more apparent; only the short crop prevented an extension of these activities the past season. Adams, Franklin, and southern Cumberland Counties, in particular, cannot long escape the necessity for local or community co-operation in packing, and eventually in selling. Such progress as has been made during the year has been mainly in co-operative buying, a field long occupied by the Grange, and more recently by the Farm Bureau. Even in local-market fruit growing it has been found practicable and profitable to pool orders for fertilizer, packages, spray material and other supplies. Co-operative buying may well be a function of the county horticultural society but it has been the general experience that county societies, which are primarily educational in function, should not enter the field of co-operative selling. Following are observations on this subject by growers:

"A co-operative association for buying only has been started here. It has done well, but is still in the experimental stage," Thed Pershing, Bucks County.

"Members of the Chester-Delaware Horticultural Society buy co-operatively and it is working splendidly," J. F. Walker, Chester County.

"We organized this year the Keystone Co-operative Grape Association of North East. About 2,500 acres of grapes signed up. Members have paid in $20,000 in cash for which they have taken certificates of indebtedness against the new company. Will handle all fruits and supplies," A. D. Phillips, Erie County.

"The Cumberland Valley Fruit Growers made no sales of 1921 fruit, there being no crop, but bought fertilizer for its stockholders. It expects to sell as usual in 1922. There is a splendid field for the extension of community shipping associations," R. T. Criswell, Franklin County.

"We buy all packages and supplies co-operatively and save about 20% of cost. We have not sold co-operatively but may do so the first heavy crop," A. E. Reist, Lebanon County.

"The York County Fruit Growers Association was organized about two years ago and has been quite successful in co-operative buying of supplies. On certain machinery 20 % reductions were offered. There has, as yet, been no co-operative selling of fruit," John C. Schmidt, York County.

What of the future? The test of an industry, as of a man, is the way it meets adversity. It has been the most trying period for fruit growers in a generation. If Pennsylvania orcharding can come through two such years as 1920 and 1921 without losing heart, surely it is founded on a rock. And that is just what has happened. Out of the 115 replies to my question, "Are we down-hearted," practically every one is a sturdy "No!" This is particularly true of those who are growing fruit for local markets, and in connection with some other line of agriculture. These two years have demonstrated anew the danger of over-specialization. That is the main reason why the "No's" are much fainter from growers in the wholesale counties, on farms where apples and peaches are practically the only source of income, than from the balance of the state.

These lean years, also, have called attention to our neglect of the small fruits, which have helped out many a man's pocketbook while the orchard was not paying for its keep. In comparison with apples and in proportion to the opportunities for successful culture and ready sale, the small fruits, especially strawberries and raspberries, are much under-planted in Pennsylvania. These are lessons that we needed to learn. As evidence of the faith of Pennsylvania fruit growers in their business, I can do no better than to pass along a few of their replies to my query, "Are we down-hearted?"

"Of course not! I have been in the fruit game for thirty years, and this is the first total failure. The trees look well and we are hoping." J. W. Prickett, Adams County.

"1921 was the worst year we have had in a generation. 1920 was about the best. It all averages up." R. L. Trax, Allegheny County.

"The only men who are down-hearted are those who do not spray or fertilize their orchards." J. W. Patterson, Armstrong County.

"I am not, as the 1921 crop is the first I have lost since 1901." C. B. Culp, Bedford County.

"No, because the 18 acres of orchard have made me most money than the other 195 acres of my farm." W. H. Amsler, Beaver County.

"The lean years are to be expected occasionally and are beyond human control. The things for us to be concerned about are those that are within our control—better spraying,

better grading, lower cost of production." C. P. Barnard, Chester County.

"Don't stop to cry over spilled milk. Pick up your stool and go for the next cow." G. E. Pierce, Erie County.

"To the real fruit grower, the lean years only tend to whet his appetite." George. H. Lincoln, Lackawanna County.

The perennial optimism and courage of the real fruit grower comes out in these replies. He knows that his business rests on a solid foundation and that the average of all the years, good and poor, will be favorable to the man who does his work well. Most of my correspondents close their letters with a cheery peek into the future, something like this: "The trees look fine, and are budded extra heavy. I expect a bumper crop this year." May their fondest hope be realized, for they deserve it!

Mr. Tyson: There is a matter which I should like to bring before this meeting at this time. Much of the information which we get at these meetings is provided by the State College and by the Department of Agriculture. We should be informed of the important horticultural information which they bring to us. We sometimes fail to realize that the information they bring to us, and the work that is done for us, is based on careful research and investigational work. This work has been liberally supported in some states. It is very little supported in Pennsylvania, and yet it is the foundation on which all our agricultural and horticultural work is based. It is the most important feature of our Agricultural Department and State College. They really have been fearfully neglected as far as support in Pennsylvania has been concerned. Sometime ago a committee was appointed to go into agricultural research in Pennsylvania. This Committee has made some investigations. They are going to make more, and they are asking the agricultural organizations to take action. With your permission I would like to ask Mr. Garrahan to state something of what they are doing in that line.

Mr. Garrahan: This committee was appointed during the inaugural ceremonies at the State College, when Dr. Thomas took charge. That committee met yesterday at noon, and they decided to extend the scope of work. They are asking the president of each association to appoint five men who are willing to go to State College and look over the research work and make a definite report of conditions there. I recommend that the President of the State Horticultural Association be instructed to select anywhere from five to fifteen men for this purpose. Also, the Committee asks that the President of the Association take his time in picking the men, any time within

a month, and that he send the names to Dr. Fox in Harrisburg, Chairman of the Committee.

The motion was placed before the Society and duly carried.

PEACH YELLOWS

W. A. Mc Cubbin, Bureau of Plant Industry,
Harrisburg, Pa.

In 1920 the Bureau of Plant Industry of the Pennsylvania Department of Agriculture, recognizing the importance of Peach Yellows in the state, undertook a partial survey of the main peach sections of the state to determine the prevalence of the disease and what was being done to control it. The results of that survey were presented to this association at its last meeting in 1921 accompanied by the suggestion that the Department of Agriculture was prepared to institute a Yellows inspection service, if the fruit growers were in favor of it, and would back it up. The expressions of opinion at this meeting were strongly in favor of the plan, and a resolution was passed giving it the support of the organization.

The Department has carried out its promise, and I am here today to give you a report of the first year's results of Yellows inspection. In 1921 Yellows inspection was conducted in 15 counties, 10 of which were well and 5 partially covered. No attempt was made to include the smaller orchards and garden trees, and the Erie section was not included because of the general absence of the disease. In these 15 counties 324 orchards, involving 387,446 trees were inspected. In these there were blazed for Yellows 17,376 trees or 4.45% of the total number inspected. In 59 orchards no disease was found; 121 had less than 2%; 41 had more than 20%; and 18 had more than 50%. Besides Erie County, Franklin and Adams showed a remarkable freedom from the disease.

There are several outstanding features of the year's work that deserve mention. In the first place inspection was very difficult last season by reason of the absence of fruit, frequent borer injury, the Yellows, starved condition of neglected orchards, and a second growth which was found in drought districts, and which was at times puzzling.

Another most gratifying feature was the uniformly interested attitude of the growers. We had expected in some cases to be met with indifference and coldness, but in every county our inspection met with all the support and encouragement that could be desired.

To a considerable extent this favorable reception of the inspection has been due to the inspection staff itself. We were

fortunate in being able to assign to this work men of long experience not only in Yellows diagnosis, but in general orchard owrk, and their experience helped not a little in the success of our program.

The most outstanding feature of the year's inspection, however, lies in the summaries of the reports from those counties where it had been possible to obtain in every case a record as to whether the grower had or had not followed previously the practice of prompt removal. As the accompanying figures clearly show in every county, the percentage of Yellows was far less abundant in orchards from which the trees had been removed.

County	Total % of Yellows	% of Yellows when removal was practiced	% of Yellows when removal was not practiced
Adams	1.59	.28	2.72
Berks	10.84	1.44	11.61
Bucks	4.71		
Chester	6.52	3.40	12.00
Dauphin	9.85	.79	11.56
Franklin	2.38	1.09	7.00
Lebanon	6.50	.25	9.00
Lancaster	10.79	2.12	25.78
Montgomery	2.61	.42	8.00
York	4.00	1.58	5.09

The success of a well organized inspection service thus seems to be an assured thing, if haphazard and often inadequate efforts by the growers themselves can reduce the disease to the extent indicated.

In looking forward to the future of the inspection service it seems plain that more inspectors are needed, not only to cover the same territory more thoroughly, but to extend the inspection into other parts of the state which have not yet been touched. To do this requires more money than our present appropriation can spare. It is possible that some additional funds might be provided, but it is likely that the final adjustment of the expenses of this service will be obtained by some sort of financial co-operation between the state and the various counties involved. It would seem a more just arrangement if the counties which derive the main benefit from this inspection should bear at least some part of the expense. I would, therefore, suggest that if there is no existing committee to which such a matter may be referred, the appointment of a committee of this association, which could assist the department in working out some basis of county co-operation, would be welcome to the Department.

Member: I do not quite understand the plan of inspection for peach yellows, that is, the expense to growers.

Mr. McCubbin: The plan we have in mind is that a committee be appointed to help in the question of bearing part of the cost of inspection. We feel that part of it should be borne by the people who are benefitted.

Prof. Surface: Has the germ causing yellows ever been discovered?

Mr. McCubbin: It has not been discovered. The nearest we can get to the cause of this disease is to state that it is what is called a filterable virus.

Mr. Fenstermacher: To what extent is it introduced on nursery stock from other states?

Mr. McCubbin: In our investigations in other states, and we have had a number, also I have had experience with yellows before I came here, we have never considered that yellows on nursery stock was a particularly serious proposition. This is shown by the fact that you usually get one tree and not a whole area started at once, and then it goes from that tree to other trees in the course of a few years. At most if you do get it from a nursery, it will start in only one tree or so, and you can easily get rid of that tree.

It was moved and seconded "that a committee be appointed by the President to confer with the Secretary of Agriculture and Bureau of Plant Industry to see what can be done in the way of formulating a plan by which the County will bear part of the expense of inspection for Peach Yellows. Committee members to be appointed by the new president. The number of members of committee to be decided by the President."

The following committee was appointed by the chair: Robert T. Crisswell, Chambersburg, Chairman; Levi Myers, Siddonsburg; L. H. Crossman, Oaks; W. S. Adams, Aspers; J. M. Balthaser, Wernersville.

Mr. Fenstermacher: I wish to give a little time to Mr. Taylor of the State Bureau of Markets who wishes to say a few words concerning the Standard Package Bill.

Mr. Taylor: During the past year some progress has been made on the problem of standardizing containers for fruits and vegetables. The Vestal Bill, H. R. 7102, has been reported favorably to the House of Representatives of the United States. This legislation has the approval of the package manufacturers, the produce distributing trade, and practically the unanimous support of all interested parties. Its purpose is to standardize hampers, round stave baskets, and splint or market baskets on the same principle that has been used in the case of the standard barrel, the Climax baskets, and the berry or till baskets. The principle of this standardization legislation is to prohibit the manufacture of containers other than the standard sizes. The passage of the Vestal Bill will prevent odd sized hampers, round stave and splint baskets

from being placed on the market and when present stocks are used up only new supplies available will be of the standard sizes.

The types and sizes of packages standardized in the Vestal Bill are the following:

Hampers: 1 peck; ½, ⅝, 1 and 1½ bushels
Round Stave Baskets: ½, ⅝, 1, 1½ and 2 bushels
Splint Baskets: 4, 8, 12, 16, and 24 quarts

In Pennsylvania the Bureau of Markets of the Department of Agriculture, in co-operation with the Bureau of Standards of the Department of Internal Affairs, has the authority, after investigation and public hearing, to establish and promulgate standards for containers for farm products. The enforcement of the standard containers which are adopted in Pennsylvania is in the hands of the inspectors of weights and measures of the respective cities and counties and of the Chief of the Bureau of Standards of the Department of Internal Affairs and his deputies.

Further standardization of packages in Pennsylvania is waiting for the enaction of the Vestal Bill which will regulate the packages used in interstate commerce.

STRAWBERRY PROBLEMS

O. M. Taylor, New York Experiment Station,
Geneva, N. Y.

In entering into a discussion of some of the problems confronting strawberry growers, it must be kept in mind that the speaker is talking from the standpoint of New York growers and not from that of the neighboring state of Pennsylvania. It is highly probable that some of the practices of successful growers in the Empire State would fall down completely when attempted in the Quaker State and it would not be too much to expect that the reverse would also be equally true. There are, however, certain principles underlying methods and practices which are fully as applicable in one place as another and the emphasis will be laid along such lines.

Problem 1.—The best soil for strawberries? Fortunately strawberries do well in a comparatively wide range of soils. It is true that certain varieties do better on lighter soils while other kinds find more congenial surroundings in the heavier clays. Most varieties, however, prefer light loams in preference to the heavier, more compact and colder clay soils. A suitable soil should be well drained, retentive of moisture, rich in readily available plant food and should be well stocked with humus, with a preference for the lighter loams.

Problem 2.—The best method of preparing the soil? There is no one best method to suit all conditions. The details

may vary widely yet the same relative objects may be secured. The best method is that which puts the soil in the best condition to meet the needs of the plant. Weedy soils should be reclaimed. Clover sod or heavy applications of coarse stable manure plowed under in the fall are of great value. Previous to planting-time, the soil is worked and reworked to secure a soil fine and mellow, of good tilth, one in which hte plants may be well-set and in which they will reestablish themselves as quickly as possible.

Problem 3.—How best to feed the plants? There is but little danger of an excess of plant food in the soil. An abundance of readily available plant food is essential for maxim results. Leguminous cover crops and stable manure should receive attention followed by a study of fertilizer needs. No defi nite formulas are applicable to all soils and conditions. The amount to use is dependent on its cost, its character, the amount already in the soil, time of year and condition of plant. Each grower must study the results of various applications of nitrogen, potash and phosphoric acid on his own farm and be guided accordingly.

Problem 4.—How may we determine what varieties to set? Selection of suitable varieties is essential for success. They must be adapted to their location. A variety may succeed admirably in one place and yet be worthless in another locality, and this peculiarity should be ascertained before planting largely to any variety. Actual tests are the safest methods to determine the value of any variety. Observation of the kinds doing well in the immediate locality, under apparently similar conditions may sometimes secure the information desired.

Problem 5.—Give a list of desirable varieties? More harm than good often occurs from such lists. To have much value, they must often be limited to rather narrow areas altho some varieties are quite cosmopolitan in their adaptability, succeeding well in many localities and under varying soil types. The following list is therefore only suggestive of some of the kinds making an unusually good showing in various parts of New York:

Barrymore, Beder Wood, Brandywine, Chesapeake, Dunlap, Excelsior, Gandy, Gibson, Glen Mary, Howard No. 17, Joe, Late Champion, Marshall, Ozark, Parsons, Prolific, Sample, William Belt.

Problem 6.—The value of the everbearing strawberry? These varieties produce fruit in the fall—August, September and early October. Come of them also fruit at the usual season. In some portions of the United States a considerable yield of attractive fruit is secured, selling in selected markets at good prices. In other localities the yield has been far from satisfactory, the fruit often inferior in size and the market

demand too weak to assure a profit. It is suggested that increased plantings be made only when the success of the previous beds has shown the venture profitable. The most popular kinds are Progressive and Superb.

Problem 7.—Shall we purchase the so-called "pedigreed" stock? Pedigreed plants are supposed to inherit in a superior degree certain desirable characters which are fixed and which are repeated year after year on different soils and in different localities without change. Such plants are certainly of more value than the common run of stock. Unfortunately the experience of growers indicates that many so-called "pedigreed" plants are so only in name, proving no better than the best plants in well-cared for fields.

Problem 8.—What are the best plants to set? Only the best stock should be used. Plants from old beds may lack vitality and may be infested with insects or diseases. Vigorous, healthy plants should be selected from beds that have not fruited and those from the earlier runners are usually larger and stronger than those which have developed later along the outside edges of the rows. The stock should show strength and vigor in appearance, and should have a well-developed root-system.

Problem 9.—How may we determine the sex of varieties? Varieties are divided into two general classes, those having perfect or staminate blossoms and those with imperfect or pistillate flowers. The first class bear flowers containing both stamens and pistils, the center being a collection of many pistils surrounded by short, tube-like parts called stamens which produce the pollen necessary to fertilization of the blossoms. The flowers of the second class lack the stamens and will bear no fruit unless the pistils are supplied with pollen from other flowers.

Problem 10.—How are blossoms pollinated or fertilized? Winds have slight if any effect on pollination. Insects of various kinds are by far the most valuable agencies in fertilization of blossoms. In visiting the perfect flowers the insects become more or less covered with the pollen which is carried by them to other blossoms and is left on the pistils. Insect movement among the flowers, however, is dependent on weather conditions.

Problem 11.—When is the best time to set plants? It is possible, if conditions are favorable, to set plants at almost any time of year. Spring setting is usually preferable as it shortens the time from planting to fruitage, secures better weather and soil conditions, and provides for but one winter's protection before a full crop is secured. Fall setting under favorable conditions may succeed but in dry seasons often results in considerable loss of plants.

Problem 12.—What system of planting should be followed? There are two general methods with modifications of each—the hill and the matted row. Each system is good in its place and each has advantages and disadvanages. In the hill system all runners are removed. This system usually gives less fruit, requires more labor but the berries are larger and more attractive in appearance. In the matted-row system the runners are permitted to develop. The matted-row usually requires less labor, the yield is greater, but the berries may average somewhat smaller. Successful growers may be found using either method with the majority in favor of the narrow matted-row.

Problem 13.—What care should be given the first season? Cultivation should begin as soon as the setting has been finished and should be continued throughout the season—whenever necessary to keep down weeds and to maintain a mellow soil condition. Flower-clusters should be removed as soon as they appear and the first runners should be encouraged to root by "bedding in." The primary object of these mother plants is to make additional plants and their energy should not be divided in an effort to produce a crop of fruit at the same time.

Problem 14.—Winter protection of the plants? In most seasons protection in some form is desirable for a number of reasons. It protects the plants from injury by heaving; retains moisture; leaves the soil in better physical condition; adds plant food in case of stable manure; retards growth if desired in the spring, diminishing danger to the blossoms from frosts; smothers weeds; keeps the fruit cleaner at fruiting time.

Various materials may be used. Those most easily obtainable at minimum prices are usually selected, such as coarse stable manure, marsh hay, wheat or oat straw, swale grass. The best mulch is one that will furnish the desired protection, will not injure the plants nor introduce weed seeds.

Problem 15.—Should beds be fruited more than one season? With a uniform stand of healthy plants free from weeds two and occasionally three crops may be harvested; many beds fail to measure up to such conditions, and in such cases but one crop is secured. If retained, the bed must be cleaned out, fertilized and cultivated.

Problem 16.—Does it pay to spray strawberries? Few if any growers spray their beds. The rotation is so short that insects and diseases seldom cause serious injury. In exceptional cases it may be desirable to spray for leaf-spot. New York growers are but little troubled by the weevil.

Problem 17.—Should strawberries be irrigated? In New York such methods are of doubtful value year in and year out. The profitable year is the exception. A system, however,

which permits of the irrigation of other crops in addition to strawberries is more likely to show a profit than when all expenses must be met by one crop. Emphasis should be laid on the conservation of moisture and on the power of soils to retain the greatest supply of water.

Problem 18.—The most important factors influencing yield? The yield largely determines profits or losses. Productiveness is a variable factor and is related more or less closely to almost every element of environment. The yield may depend on the variety itself, on temperature, character of soil, food supply, humus in the soil, and cultural treatment given. More important than any other factor, however, is that of the water supply. This outweighs all others and number of quarts are usually associated with amount of rainfall.

Problem 19.-The harvesting and marketing of strawberries? The fruit as it appears in stores and markets indicates at once the importance of careful work. Baskets and crates may be soiled; broken or patched, and the berries show utter lack of uniformity in firmness, size, color, freedom of dirt and decay. To arrive at its destination in good order, the care must begin in the field. In picking and handling the berries the surface should not be bruised. On arrival to market the color should be well developed over the entire surface. If picked wet, the fruit may not keep well. Hull or calyx should be attached to each berry. To some extent it may be desirable to grade the fruit somewhat in picking, placing the inferior fruit by itself. Care and attention along such lines are reflected by clean and attractive packages, well-filled boxes of berries which are a delight to the eye and in addition the flesh-characters should be such as to be pleasing in flavor and quality.

THURSDAY AFTERNOON, JANUARY 26, 1922

Mr. R. N. Rees of the New York State Fruit Packing Co-operative Association, Rochester, N. Y., discussed "The Co-operative Packing House Movement in New York State." (The Secretary has been unable to secure from Mr. Rees a copy of his paper, and no stenographic notes were taken. A summary prepared by President Fletcher of this Association is here substituted.)

CENTRAL PACKING HOUSES

The marked success of the Central packing house movement in western New York during the past four years leads to the conviction that at last we have a method of co-operation among wholesale fruit growers that is practicable in the East. There is need of central packing houses in those parts of Penn-

sylvania where ten or more wholesale growers live within a radius of six miles, and on good roads. The main advantages of a central packing house are that it secures a standardized pack which usually commands a higher price, and that it leaves the orchardist free to devote his entire time to the growing of the fruit. There is at least one successful central packing house in Pennsylvania—that at Biglersville; this is a stock company, not a strictly co-operative enterprise, but it illustrates very well he advantages of co-operative packing and selling. The cost of packing is usually fully as high as in the best private packing houses of large growers; the gain is in the selling price. The method is more practicable for a number of comparatively small growers, having from five to twenty-five acres each, than for large growers; but a large grower should find it advantageous to pack under the same specifications as a near-by packing house association of small growers, and pool his fruit with that of the association.

The western New York plan, briefly, is as follows: Fifteen or more growers, having an aggregate production of, say, 20,000 barrels, put up a one floor packing house, preferably on a siding, at a cost of about $3,000. Sizers, track and other equipment cost $1,500 more, making a total investment of $4,500. These fifteen men put up $300 each, regardless of their relative acreage, or the comparative age of their orchards. This may be in cash or the growers may give a demand non-interest bearing note. The latter is used as collateral by the Association in borowing money at the bank. The differences in acreage between growers are equalized by making the interest on this investment a part of the packing charge, so that a man with 1,000 barrels to pack pays more toward the cancellation of the debt than the man with 600 barrels.

A binding contract is absolutely necessary. This is entered into about July 1. The grower appoints the Association his agent, to pack and sell all his fruit, (except certain reservations, which must be all, not part, of a certain variety). The fruit is brought to the packing house in burlaped barrels or in crates, tree run, and the grower receives a receipt for it. It is run through the sizing machine and graded by itself; the grower is credited with the quantity of each grade and size that it packs out. The New York associations have found it imperative to pack into one quarter inch sizes; it is the only way to secure the uniformity that is essential to standardizaion. From 600 to 800 barrels a day are packed with a crew of fifteen to twenty men and girls.

The fruit is pooled by variety, grade and size for the entire season; that is, the sales of all the two and one-half inch Baldwins, A grade, are averaged for the season, and each grower receives the same price. Hence,if any grower has

larger or better fruit than his neighbors it shows in his returns. A packing house association may employ a local dealer as its sales agent, or it may engage one of the national fruit sales agencies for this service. In western New York about thirty associations have united in a central sales organization, but this is not essential except in a large wholesale district

The cost of operating the local association is met by a per package charge, calculated after the season is over. It includes labor, interest on investment, etc. The total is divided by the number of packages packed, this giving the charge per package. The charge is the same for all grades and sizes. In 1918 and 1920 it was 21 cents a barrel; in 1919 (a short crop year) 33 cents.

The central packing house is not as generally useful in Pennsylvania as in western New York, because the orchards in our wholesale districts are larger and farther apart; the average size is about fourteen acres in New York, and thirty-five acres in southern Pennsylvania. Nevertheless, there are many sections of Adams, Franklin anl Cumberland counties, and scattered localities in other parts of the state, where the central packing house is the most feasible solution of the marketing problem. It is worth study by any community of wholesale fruit growers.

Member: Kindly tell me about your experience with pooling versus non-pooling?

Answer: We started out without pooling, but it did not work. The sentiment is strong for pooling, and we are pooling for the entire area, not only for members of the association. At the start we use two pools, the fall pool and the storage pool. Each man decided which pool he would go in. Sometimes he had half of his fruit in the storage pool and half in the fall pool. At the present time we are using an all season pool. This has the advantage of giving members the benefit of sales made early in the season for others fruits in the same pool.

Mr. Grove: What kind of a contract do you have with growers?

Answer: There is a contract between the grower and the local association. The grower agrees to deliver his full crop of fruit, giving a list of varieties and approximate amounts, to the association packing house, at such time and in such condition as the association shall direct, for grading, packing and storage or sale. The contract also carries a damage clause, in which he agrees to pay the association one dollaar a barrel, or fifty cents a basket, on any fruit that he fails to deliver. That contract is given each year, with a fifteen-day cancellation period each year, usually from the 15th to the 30th of May. If at any time during that period he wishes to

cancel, he can, otherwise it continues until the next year. Under our state laws we can only write a one-year contract.

Member: How do you pool, according to varieties?

Answer: We pool first by varieties, then by Grade A and Grade B. Then the A Grade is subdivided by size, 2½, 2¾, etc.

Member: How about money advances?

Answer: We make weekly returns for fruit all through the season. On apples we always sell much of the crop during the packing season, which makes some money for immediate advance. Then if any associations, or members in the association want advances beyond that which has actually been received from the fruit, that is obtained on warehouse receipts.

Member: What distance can you take apples from the orchard to the packing house?

Answer: In most of our associations we do not have a long haul, two to four miles. I think we did have last year two or three non-members at fourteen or fifteen miles. Seven miles is the ggreatest at which we serve any regular members.

Question: Do you think a variety pool would work out, closing the pool when the subsequent varieties begin to crowd out the next variety?

Answer: That might work out in your location. We have only one variety of peach of importance, the Elberta.

Member: Some of our people do not feel that they can wait for settlement until the closing up of a pool season.

Answer: We close each variety as soon as possible. You can make a ninety per cent advance, and your ten per cent would easily cover everything for another week while you are finishing up.

Member: The New Jersey growers try to have a one-day pool. One or two days makes a wonderful difference in price.

Answer: It does make a difference on early varieties more than on late stock, and one-day pools and two-day pools have been used in some sections very satisfactorily. They pool by variety each day.

Question: What arrangement do you have with non-members for handling their stock?

Answer: We have not encouraged non-membership business. This year was the first that we handled fruit for non-members, and we did this because of the fruit shortage in the district, in order to give greater volume in packing houses. We took them on exactly the same basis as members. The non-members assumed the expense and overhead, and received exactly the same as members. The non-member signs the same contract, but does not have the renewal right.

Dr. Fletcher: Are you able to pack in a central packing house as cheaply as a large grower in a private packing house?

Answer: I think not. A larger grower can pack cheaper than twenty men producing the same number. One item is the matter of shifting from one lot of fruit to another, and the additional floor space for receiving various lots. All these things tend to increase expense. It can be packed more cheaply than the small grower can pack, because he is not in position to have the equipment and the facilities necessary for packing, but when it comes to the large grower, I think the cost will run higher.

Question: Have you any figures as to the cost per barrel of packing in a packing association?

Answer: There has been a wide range of cost this year. In figuring the cost we figure report cost and overhead, such as interest on investment, taxes and depreciation. All have entered into the upkeep of the plant, also labor. Taking all these into consideration it has varied from seventeen to forty cents in different associations. This is a very wide range. Here and there comparatively few varieties were to be handled, and again we had good straight runs. This year our costs were high because we had a light crop, and all during the forepart of the season we would have a few of each variety coming in, not a good steady run at any time. We had a lot of idle labor to take care of, and also only about half a normal volume to spread this overhead on.

Question: How does that price compare with the cost in a normal year?

Answer: I would say that around 25 cents,—22 to 25 cents, with good straight runs, would be about normal.

Member: In connection with the packing in private houses and associations the Federal Bureau of Markets made an investigation, and found that the labor cost in a co-operative association ran very slightly higher than the labor cost in the large private packing house, but that the product of the co-operative associations was superior to the orchard pack, and it more than made up for the slight difference in labor cost.

"GROWING GRAPES"

By C. C. Debenham of Jersey Shore, Pa.

How many here have a vineyard? I am wondering whether you want something to take its place when your source of cider fails, or whether you are looking for income. Doctor Fletcher, in his report this morning, stated that there were but eleven members that reported a successful year. I was one of them. I had a total failure on fifty acres of orchard,

but ten acres of grapes turned my year into a success. I am in the northern central part of the state. I can not tell you what you should do in the southeastern part, or in other parts.

Location: In locating a vineyard I prefer high land, southern exposure, well drained. Our greatest enemies are fungous diseases, and fungous diseases are encouraged by dampness. Consequently, we want a location that dries out quickly, and one which is not subject to fog. The preparation of the land for planting is a heavy cover crop the previous year, turned down while rank. The ground should be harrowed then, put in good shape, and left until spring.

Now comes the matter of spacing. One near my home in New York State was set out on good ground, and thrived well, spaced 7 by 7. It grew rapidly, came into bearing quickly, but never harvested a crop. Mildew and black rot took the crop each year. He was compelled soon to take out every other row. The rows in New York State are usually eight and nine feet apart. My vineyard is set 10 by 10 and when I tell you that I have certain blocks this past year that produced almost six tons to the acre, I do not think that you will think that my spacing is too far apart.

Varieties: My really standard ravieties are Worden, Delaware, Niagara, Concord and Catawba, ripening practically in the order named. People are not hungry for grapes while peaches are plentiful. Worden ripens too early and interferes with peaches. Delaware with me is a regular and heavy bearer. It has one fault, it is subject to foilage blight, and Bordeaux does not seem to control it. If the foliage is affected, the color is also. Niagara is the finest for table use, and is the most popular. However, the Niagara is quite susceptible to black rot. The Concord is the best of all. It is a rank grower, a regular cropper, and probably is as resistant to black rot as any variety, and under the 18th Amendment it seems to be the one that they all demand. The Catawba is our latest grape that you can hold for the Thanksgiving market, but it is very susceptible to black rot. If I were going to set another vineyard, I would set proably 25 per cent Niagara, the balance Concord.

Roots: Now as to the age of the roots. We have used one and two-year-old roots. The one-year-old root, I believe, is the best. A No. 1 root will have a root system of fifteen to eighteen inches. At setting time that root system should be clipped off to not exceed eight inches in length, and a hole dug about deep enough so that when the vine is set, and the hole is filled, all that is above the ground are two buds. In setting the roots they should be spread, just as in planting trees. After they have become well established, go through the vineyard, and break off the weakest buds. One bud is all

that you want, but leave two so that if anything happens to one you still have another. It is not absolutely necessary to put a small stake at each vine, but you will find it to your advantage. A small stake sticking out of the ground fifteen or eighteen inches will furnish a means of fastening the new growth, saving the danger of having it broken off through cultivation.

In setting out your vineyard stake the rows as straight as possible. The second year it is advisable to put your posts in. Now we find vineyards with posts every four vines, or every three vines, but mine are every two vines. In the second year I put posts every six vines, because by putting one wire I have a support for my vines. Be sure that the end wires are braced, because here is where the strain comes. Tighten the wire by hand. Do not use a stretcher. If you use a stretcher, you will have broken wire, because as soon as the weight goes on, you will have entirely too much strain. My rows are 440 feet long, and I do it this way.

Pruning: There are several hundred systems of pruning, but there are but two that are important. One is the cane system. When you go in to prune, maybe your vine has not reached the wire. It it has, cut it off just above the wire, and fasten it to the wire. If it has not, cut it back to where the wood is rather stiff. As they bud out in spring, if they have not reached the first wire, go through your vineyard and strip off all buds except the strongest one. This need not be the top bud necessarily. That is the trunk of the vine. After the trunk is formed, develop two short spreading canes, containing not more than four or five buds each. If at the end of the third year your vine has taken a good stand and made a good growth. possibly it can stand four canes. At first cut those canes long enough to be tied down to the second wire. If the vine is vigorous enough, you can come up to six canes, with eight to ten buds each. You can even have ten canes. Remove your prunings from the vineyard and burn them.

Question: What distance do you have the wires from the ground?

Mr. Debenham: Three feet. I do not put them less than two feet. We must keep away from dampness with grapes, because it is fungous diseases which we must fight.

Question: What is the height of the top wire?

Mr. Debenham: I use a seven and one-half feet post. Above ground it is between five and one-half and six feet, and the top wire is just on the side of the posts two or three inches from the top. We divide the distance between the first wire and the third wire into equal parts.

Question: How do you set the post?

Mr. Debenham: Sharpened and driven in.

Mr. Debenham: The canes are tied with a small wire. The better practice is to tie these canes, not wind them around the wire. The advantage is that in pruning time you can take a hold of it and pull it off easily. During the war the wire was so poor that it even rusted through in two months, and as soon as a wind came along the foliage was on the ground. So I twisted it around the trellis wire. I have a man follow me while I do the pruning, and he takes off the superflous wood.

The green wood must be tied. The war compelled us to do things that we would not consider good practice, but I think most of us got real lessons in saving time from the war. I did in regard to green tying. The old method was that as soon as your green wood made sufficient growth to reach the second wire, the tiers were put to work with green rye straw, and if any time we found that the green wood had fastened itself on the trellis wire or cane, and it was sufficiently long, we unloosened that, and tied it up. That left all the grapes hanging loose. You were not bothered with tangled clusters. But during the war we could not get tiers, and the first thing I knew my grapes were in bloom. When they were out of blossom the new green growth was of considerable length. I at last secured enough tiers, and we went in there. We did not loosen any new wood that had caught to the trellis, but we did make the one tie. I watched my vineyard and was surprised to find that that was all that was necessary, so this year I simply kept out of the vineyard until after blooming time, went in with the tiers, and once through the vineyard put the grapes up in excellent condition. We did have some tangled clusters, but the time it took to take them out, cutting them in two or three pieces, surely was not nearly as expensive as the tying. I know growers who have tiers in the vineyard for six weeks.

Pests and Diseases: We have a bug which attacks our grapes. It is the Grape Berry Moth. If your vineyard is located on high, well-drained ground, I think that you are practically immune from Mildew. In fact I have never seen a mildewed berry in my vineyard. I think grapes have black rot as naturally as chickens have lice, and that is the one disease that we must fight. It is controlled easily by a thorough application of Bordeaux mixture. I use the 4-4-50 formula. With the first two or three sprays add arsenate of lead to control the insect pests. Make the first spray about the time the buds commence to swell. Spray again when the growth has attained some six or eight inches. Then do not spray until they are out of blossom. Then I give another thorough spraying, and the last spraying, except in extreme cases where the weather or something else has been against us, is when the grapes are about the size of peas.

I use a power spprayer, with a Bordeaux nozzle, and a pressure of 200 pounds. With that pressure I find that I am able to penetrate the row pretty thoroughly. The first spray I spray the one side of the row, then the succeeding spray, which may be ten days or two weeks later, I spray the opposite side of the row. Consequently, I save time, and I can see no difference in the results in the control of black rot than when I sprayed on both sides.

Cultivation: The first year give it clean cultivation, and cultivate both ways. The second year you will have one wire up and you cannot cultivate it both ways, but give it clean cultivation. There is one little point that I have overlooked, that is the direction of your row. You can run the row east and west, or north and south, but I think if your land lies so that it is possible to run your rows north and south, that is the proper way. You have the benefit of the eastern sun and the western sun. Where your rows are trellied east and west the sun is on the one side of the row the entire day.

After the second year, possibly in the third year, you want good cultivation up to, I should say, nearly the first of August. In New York State if we did not get our vinepards plowed in the fall, we thought they were ruined, but the war compelled me to let my vineyard go over without the fall plowing. Help was so scarce that I did not get a thorough cultivation much beyond the first of June. Consequently, I had quite an accumulation of weed growth. The next spring this accumulation was plowed down. I noticed a marked difference in my vineyard. The question arose in my mind whether it was a good practice. I thought it might work for one year, but how about two years or three years in succession. I was bound to find out. The second year I plowed in the spring. I kept my cultivation going that year until about the first of June. It also was a wet season, and I was blessed with a good growth of weeds. The latter part of July, or the first of August, my vineyard had to be mowed, but this left a pretty good mulch. We still had time for a good second growth of weeds. When that was turned down the following spring, I saw another improvement, and so I have adopted this method.

It is not any cheaper than clean cultivation, but I think that the humus that we add pays more than clean cultivation. Sow a cover crop if you do not have weeds. We are keeping up the organic contents of the soil.

Fertilization: The first year after setting I use a small handful of nitrate of soda around the plant to give it a "kick," and between one-half and one pound to a bearing vine. Year before last I used only a trifle over one-half pound. I had greater results from the one-half pound than from one pound last year. That was not the fault of the nitrate of soda, but the year before we had a good season for the nitrate of soda to

become soluble. This year during the greater part of the growth period we had severe drought in my section, and consequently the ammonia was not available, but before the season was through it accomplished the desired results.

Question: What is the diameter of your post?

Mr. Debenham: We use a small post, one that is four to four and one-half inches in diameter. That is plenty heavy enough. The end posts we usually make heavier.

Mr. Bowers: We had, two years ago, twenty-three tons of grapes, practically all Concord. We sold them at 7 cents a pound, or $140 a ton. We could have sold more, if we had had them. Last year we were practically knocked out. We had between two and three tons, and long before the grapes were ready to pick people came and offered us 10 cents a pound, wholesale, or $200, a ton.

RASPBERRY AND BLACKBERRY PROBLEMS

O. M. Taylor, New York Experiment Station,
Geneva, N. Y.

A portion of the morning program centered around a discussion of some of the problems connected with the growing of the strawberry. We now take up the discussion of another class of fruits different in habits, in character, in requirements and yet with certain problems in common with the strawberry.

These classes of berries now under discussion are less cosmopolitan than the strawberry as to soils and in a selection of location and soil the climatic factors of heat, cold and moisture are of more importance. The plants are less hardy than strawberries and in exposed locations more or less severe losses may occur. The fruit also matures slightly later, at a time of higher temperatures and when the need of moisture may be more acute. For these reasons, there are two prime essentials of soils for these berries, namely, proper drainage and second, ability to retain moisture. Wet feet may be followed by severe winter injury and droughts are reflected by scant harvest.

Varieties: The selection of varieties for setting is fully as important as with strawberries and the methods followed should be similar. Adaptation should be determined either by actual trial or by careful observations of the kinds doing well in the immediate locality under apparently similar conditions. It is impossible for a grower to test all varieties. Such work may rightly be left to State Experiment Stations and similar organizations but the most promising of the newer varieties should find their way into the trial plantation of the commercial grower and their local value determined.

Lists of desirable varieties are too often misleading. The success of a kind in one place is no index of its true value elsewhere. The lists which follow are therefore only suggestive and indicate that those kinds have found favor in certain portions of the Empire State and may therefore be considered worthy of trial.

Red Respberries: Cuthbert, Donboro, Empire, Herbert, June, King, Latham, Marlboro, Ontario, Perfection.

Back Raspberries: Black Pearl, Cumberland, Diamond, Gregg, Honeysweet, Kansas, Ohio, Plum Farmer.

Purple Raspberries: Columbian, Royal Purple.

Blackberries: Agawam, Ancient Briton, Blowers, Early Harvest, Eldorado, Erie, Kittatinny, Lawton (New Rochelle), Lucretia, McDonald, Mersereau, Rathbun, Snyder.

The purple raspberry in New York is assuming considerable commercial importance. Its value as a very productive, high quality berry when cooked is becoming recognized. They are unfortunately unattractive in color and do not ship well.

Everbearing raspberries are of doubtful value in New York. The statements made in regard to everbearing strawberriees will apply to the everbearing raspberries. There are portions of the country, however, where this class of fruit has value commercially. Ranere or St. Regis as it is often called, is the leading variety. The Erskine Park a newer kind is worthy of trial where this class of berry is desired.

The value of "pedigreed" plants is uncertain. Unfortunately most growers are finding that such stock is not one whit better than the plants that can be dug from their own plantations. If the plants show decided improvement in valuable characteristics through various seasons, on different soils and in other localities as well—then such stock may well be considered to have superior value.

Planting: The time of planting must receive consideration. Under ordinary conditions red raspberries and blackberries may be set either in fall or spring. Purple raspberries, black raspberries and dewberries all of which are usually propagated from tip layers should be set in the spring. Summer planting of red raspberries is sometimes practiced, the young shoots being transplanted during cloudy or wet weather.

The distance apart of rows and plants depends entirely on conditions. If team work is utilized the rows are farther apart than where single horse work is used. The spacing of rows and plants depends on character of soil, on the variety and on the method of culture. In Western New York the matted row is the rule with red raspberries while in the Hudson Valley, the plants are often grown in hills about 5 feet apart each way. In the western part of the state the berries are usually grown in blocks but in the eastern portion,

inter-planting is common and many plantations of fruit trees or grapes may be found which are inter-planted with one or more of the small fruits.

The necessity for thorough tillage is great. This is especially true of the fruit reaches maturity, for lack of moisture at that time may greatly reduce the yield. Cultivation should begin early and be repeated often enough to maintain a mellow soil condition and destroy weeds.

If the expense connected with irrigation were not too great, and if the outfit might also be used in connection with other crops, there might in many seasons be considerable profit through the utilization of some such method; unfortunately the experience of most of the growers in New York who have attempted the irrigation of their plantations has not been very satisfactory in most cases. Special attention should therefore be given to put the soil in such condition that it may retain the maximum amount of moisture and that by thorough cultivation and in some cases by mulching, as much as possible of the rainfall may be conserved for the use of the plants.

No definite formulas are given at this time for feeding the plants. Land must not be too rich, resulting in excessive growth followed by winter injury. Moderate applications of stable manure or fertilizers may at times be used with caution. The plant food in different soils is always variable in kind and amount and exact specifications as to kind and amount of supplemental fertilizers are too often misleading. Such questions must be worked out on the various soils by actual tests of the different materials. The application of nitrogenous fertilizers should be made sufficiently early so that growth may not be over-stimulated late in the season.

Pruning: Growers differ in their methods of pruning. The old wood is usually removed soon after harvest. Red raspberries are usually not summer-pruned but grow unchecked during the summer. The following spring they are cut back to the desired fruiting height. Black raspberries are, as a rule, summer-pruned, stopping the new growth by pinching off the succulent tips. In the spring the lateral branches are shortened back from 1-2 to 2-3 their growth. Purple raspberries are usually pruned as are the black raspberries, pinching the new growth a little higher and leaving the laterals slightly longer. Growers differ in pruning the blackberry. Some prune as with the red raspberry while others follow the method used with black raspberries—either method usually giving good results—although in severe winters more injury may develop on the summer-pruned canes.

Occasionally a grower may wish to rejuvenate an old or neglected plantation. In exceptional cases this may be accomplished by cutting all growth to the ground, applying

plant-food and giving thorough cultivation. Such plants, however, are usually beyond help largely because of the havoc of insects or disease and should be discarded before they become a liability.

Diseases: We now come to a subject that at present is causing great uneasiness among berry growers. It is in regard to the control of certain diseases. There are several of these troubles concerning which but little is known and no satisfactory remedies can be suggested. Orange-rust, cane-blight, crown-gall, anthracnose and yellows or mosaic as it is now called, are taking heavy toll in some localities. For the most of these troubles the only suggestion from plant pathologists is to dig and destroy the affected plants. Possibly, spraying for anthracnose may provide some relief if the cost is not prohibitive. The most serious of these troubles, however is that of "mosaic" as it is called. Plants become stunted or dwarfish in growth, leaves roughish and mottled with yellowish green and the fruit fails to mature properly. The cause of this disease is as yet unknown. It is thought to be contagious under certain conditions, the unknown organism being located in the juices of the plant and that the disease may be spread from diseased plants to healthy plants by various sucking or biting insects. Nearly all varieties of red raspberries seem to be affected more or less by this disease. Specialists are making a study of this trouble and it is hoped that a remedy may be soon discovered.

The last subject to be touched upon at this time is "Should the planting of small fruit be encouraged?" Could the future be forecasted, the answer to this question would not be so difficult. From the standpoint of commercial purposes the answer often depends almost entirely on local conditions and on the man himself who is the guiding hand and upon whom again and again the success or failure depends. Where several of the various small fruits are grown, it is seldom that in any one season will there be a failure of all of them from climatic conditions nor is it likely that the market for all the fruits will be equally poor in any one year.

The writer, however, has decided views if the purpose for planting is for home use. It is seldom that our tables are well filled with more than one of the small fruits; yet most growers are so situated with reference to climate that strawberries, red, black, purple and yellow raspberries, blackberries, currants and gooseberries may all be grown in sufficient quantity to supply all household uses to which these fruits may be available. Selection of varieties may also be made in such a manner as to furnish a supply of early, mid-season and late berries of all these fruits greatly prolonging the period during which the fresh fruit may reach our tables. Most house-holders have had but little opportunity to use certain varieties repre-

senting those highest in delicate flavors and of best quality and have naturally been discouraged from testing out other varieties because of the indifferent results secured from those already grown. The lists of varieties are now so large that they include kinds of perhaps but little value commercially but which may well occupy a garden spot because of tempting appearance and a texture, flavor and quality difficult to surpass.

Prof. Surface: How about the Loganberry?

Prof. Taylor: We have made attempts to fruit it, but it had no value in New York in a commercial way.

Mr. Vincent: What is the Donboro?

Prof. Taylor: It is a red raspberry.

Member: How do the Eldorado and Blowers blackberries compare?

Prof. Taylor: At Geneva, and in other parts of New York we find that the Eldorado is more hardy. The Blowers has not done as well. We have considerable acreage in fruit of the Eldorado, largely on account of the hardiness of the Eldorado, throughout the state. It is the most satisfactory blackberry, if winter injury is not the controlling factor. If that is the controlling factor, then the Snyder is the hardiest.

Dr. Fletcher: Are purple raspberries desirable for local markets in Pennsylvania, rather than red?

Prof. Taylor: It would depend upon whether the people who purchase are educated to buy them. If they are not you will have trouble in selling, because they will not stand up and look as well as the red raspberry, but if the value of the purple raspberry is once known, you will have no trouble to sell it. That is the history of the purple raspberry in parts of New York State at least.

Dr. Fletcher: Is there any red raspberry that approaches in productiveness the purple?

Prof. Taylor: The variety that most nearly approaches it in productiveness is the Herbert, but it is not equally productive.

Question: Will it be profitable to mulch strawberries in Pennsylvania?

Prof. Taylor: We consider that in New York it is a decided advantage to mulch strawberries. There are a number of desirable objects that might be secured in the mulching of strawberries. In the first place, it protects the roots from injury by the repeated heaving of the plants by freezing and thawing. Again, it conserves moisture. The ground under the mulch is more moist than the other soil, and the strawberry of all the small fruits is the ont that is in need of moisture. Then again, the soil itself is in better physical condition if it has had a covering. If you use stable manure, you are supplying plant food, and if you have not soil rich enough,

you may aid it somewhat, although we may introduce weed seeds when we use stable manure. If we want to hold the plants back to retard blooming, especially where there is danger from late frost, it is a decided advantage, and also if we are trying to secure the latest limits, it will retard ripening. Lastly, it will keep the strawberries much cleaner if you have a mulch.

Question: What material shall be used?

Prof. Taylor: Sometimes one material, sometimes it may be another. In New York State we use miscellaneous material, depending upon the cost, and upon their availibility—wheat straw, oat straw, barley straw, marsh grass, any of these materials. The best material is one that may be applied readily, which is not too expensive, and which will cover the plants out of sight, that is all that is needed. A couple of inches will put them out of sight, and will protect soil from thawing. It should be one that will not be blown off by winds. If the material is too fine, when it becomes packed we are liable to have injury. Leaves must be used with caution, because they mat down too tightly and too closely.

Question: How about mulching the whole home raspberry patch with straw in the summer time to keep down the weeds and conserve the moisture?

Prof. Taylor: There would be some advantage in mulching close up against the plants, but unless the whole of the ground is thoroughly mulched, it would not save as much moisture as if you could cultivate between the rows, and then use the mulch around the plants. That would be a better method than to put on the mulch alone.

Dr. Fletcher: The first question for discussion, "Is the Robin a Menace to the Grower of Small Fruits?" At State College it got forty per cent of our crop of strawberries and raspberries.

Mr. Peirce: It took all my raspberries this year. There were no worms around at the time the raspberries were ripe. The weather had been so dry that there were no worms, at least the robins could not find them.

Dr. Fletcher: There was an unusual amount of damage from robins this last year. Probably the dry weather was the cause of it. Does the damage seem to be enough to warrant any action on the part of the society? Are we justified in killing the robin under these conditions?

Prof. Surface: I think not. The stomach contents of many robins show that when they have young they will take fruit, but many other birds will, but the robin is one of the greatest insectivorous birds. The way to overcome the taking of fruit by robins is to plant some soft, sweet variety like Governor Wood and the mulberry. Then the birds will work on them. I would certainly want the advantage of the birds around the orchard. If I could do nothing more I would

plant more of the fruit, so the birds could have their share.

Member: In New Jersey there is a strong feeling against the robin by fruit growers.

Dr. Fletcher: There being no motion, I take it that the fruit growers do not want to recommend that the robins be slaughtered.

Question: Can some one tell me about barium tetra-sulphide, (B. T. S.) as a dormant spray for peaches or apples?

Mr. Atkinson: I used it last year as a semi-dormant spray, about the time the buds were bursting, and it apparently was all right, but it did not give as good results on apples as ordinary commercial lime-sulfur. It is all right on peaches.

Question: What is the comparative cost?

Mr. Atkinson: Slightly more expensive, but unless you have things very convenient in your orchard it saves a lot of work there. If carefully handled it is easily mixed.

Prof. Surface: I wish to ask Mr. Taylor about the Lucretia dewberry.

Prof. Taylor: That depends upon the market. If you wish to give it more time and attention than you do blackberries, then I believe the dewberry has a place. I would recommend the Hudson variety.

Question: . . How about Atomic Sulphur, to be used in place of self-boiled lime-sulfur?

Mr. Atkinson: I have used it for two years. It is absolutely satisfactory in my experience.

Question: What is the cost compared with self-boiled?

Mr. Atkinson: It costs nine to twelve cents a pound. Last year I went to the orchard about ten days before the Carman peaches were ready to pick. They were beginning to ripen up, and were rotting pretty badly. I got the sprayer ready, and we sprayed those peaches with Atomic Sulfur before night. It checked the rotting so that it was almost negligible. We had less trouble with rot with Carmans last year after that application than we ever had before. Those peaches kept longer than any Carmans we ever had, and there was practically no discoloration due to the sulfur.

Dr. Fletcher: It is being used more and more by the New Jersey peach growers. The making of the self-boiled lime-sulfur is a tedious operation, and Atomic Sulphur, which can be put right into a barrel, is much more convenient, and as far as I can discover it gives equal results. It is a little bit more expensive than the self-boiled.

Member: Can the Bureau of Plant Industry send a man to make inspection for peach yellows?

Mr. Holdridge: The intention was to follow up the work for two or three seasons. Fifteen counties were covered last season, and the Bureau is ready to do what it can.

Member: Do you think it worth while to disinfect the shears in pruning, or the knife in borer hunting? Can peach yellows be carried in that way?

Mr. Holdridge: I think it is well to use care in that regard.

Dr. Fletcher: If pruning peaches in the winter time, and some of the trees are diseased, is it necessary to disinfect the tools?

Mr. Holdridge: If a man is to get the minimum of peach yellows, he will take out all trees showing yellows in the summer, or as soon as the first indications of yellows. Wherever careful removal has been attended to, the owner has lost less than 2 per cent; where not carried out they are losing as high as 28 and 30 per cent. It would not pay a man to have a tree in his orchard in the winter time with yellows. It would not be transmissible at that time, but the tree should not be there.

Mr. Funk: I wish the Department would take up the matter of southern stock being free from yellows. We know that when we get to a certain line going south, they claim to be rid of peach yellows. There is none in Georgia, none in some other southern states, and it is only necessary to come a few miles north of that line, and we get into yellows. Those men claim they have no yellows, and still the worst trees I have came from a nurseryman who claimed he never had a yellows tree within miles of his nursery. We planted trees from his nursery, and in three or four years they were polluted. What I want to know is whether or not those trees from the southern nurseries are not just as full of yellows as the trees of the northern nurseries. It is almost certain that we can spread yellows by budding; if we take a bud from a diseased tree and put it into a good tree, the good tree will almost certainly develop yellows. I would like to see them take buds from trees in Pennsylvania that they know have yellows, and put those on seedling trees, plant half in Pennsylvania, and the other half in Georgia. Grow them for four or five years, then bud from those trees in Georgia on new trees again, and plant them in Pennsylvania. I would like to know whether the trees that did not show yellows in Georgia would not show yellows again in Pennsylvania. I believe if this is carried out, we would be a little bit more certain of the stock from the South. I believe the nurseryman there would take a little more pains if they felt that they may be budding trees to spread yellows in the North. There is no question in my mind, but that the nurseryman have yellows in the South on stock that they are budding from year to year. It does not look as if we could depend on southern nurseries.

Mr. Holdridge: Yellows will show up the first year after they are sent from the nursery.

Mr. Funk: I have never seen a peach tree develop yellows under three years.

Mr. Grove: We are here to talk over many subjects, and I am wondering if there is anything more worth while than co-operative movements. I want to know if there is anything going on in this line in Pennsylvania. We see the western fruits coming in under strong organization, and I wonder if we are fully alive to our need of co-operation and organization. We expect to have a nice crop of apples. If locally, we can not get organized, is co-operation possible for a number of men who are scattered in different parts of the county, but under a central control. If so, I am ready to join in.

Prof Surface: Bedford County a few years ago had an organization of that kind that proved very satisfactory.

Mr. Vinson: I am sorry Mr. O'Neil is not here, because at Norristown and Collegeville they have just organized. It is a step along that line. The success of their movement will have a great deal of influence over the state, I am sure. That is the big problem in this state, especially in the southern part. If we are driven to it, we are going to do it. It must come.

Dr. Fletcher: What Mr. Grove wants to know is this; if people can not be interested in a local co-operative association, is it practical for growers to co-operate in selling fruit and packing it, if widely scattered in different parts of the county?

Member: First there must be a local organization before anything can be done.

Mr. Atkinson: I would like the opinion of some other growers as to the value of the Delicious as a standard variety in Southeastern Pennsylvania. I would like to know if it is a good vigorous grower, and would it probably be a good annual bearer?

Member: It does not do well in Lancaster County.

Prof. Surface: Mr. Engle, the nurseryman at Marietta, had some of the finest Delicious that I have ever seen grown. In Cumberand County with me it ripened too early.

Member: With me, in Lancaster, it is a poor bearer.

Member: I found it a good keeper, but a shy bearer.

Dr. Fletcher: My general impression is that it is a good local market variety, in most parts of the state, but not so well adapted to wholesale districts.

Adjournment.

THE NEXT STEP IN THE APPLE INDUSTRY OF THE CUMBERLAND-SHENANDOAH REGION*

By S. W. Fletcher

There are many faint hearts in the apple industry today. We have had two leans years; let us hope that the period of our affliction may not be like the seven lean years of Egypt. The Cumberland-Shenandoah Region has suffered as much as, if not more than, other apple districts of the East. A year of good crops but very poor prices, then a year of almost no crops at all—this is a sequence of disasters to try the faith of the stoutest heart. We were due to have a sharp reaction from the inflated prices of fruit and the speculative values of orchards during war times, even without the freeze of last spring. We were riding for a fall and we got it. But I shall not harass your feelings any longer with painful retrospection. It is neither common sense nor good sportsmanship to submerge ourselves in a dreary past when there is so much that we might be doing to ensure a bright future.

The apple growers of the Cumberland-Shenandoah Region have little cause to be pessimistic about the future, however trying may be the present. This region is commonly held to include the Cumberland and Shenandoah Valleys from Harrisburg, Pennsylvania to Staunton, Virginia, together with the adjacent Piedmont counties east of Blue Ridge. Adams County, Pennsylvania, however, is the only Piedmont County that naturally belongs with the Valley, horticulturally. It grows the same varieties and has the same cultural problems. The southern Piedmont counties are the home of the Winesap and the Albemarle Pippin, not of the York and the Stayman. They are distinct horticulturally and must work out their own salvation. We are concerned here only with York Imperial territory. I like to call it the "Blue Ridge Country," for it is traversed and dominated by this historic mountain. It is a geographical and horticultural unit. Although it embraces portions of four states and crosses the Mason and Dixon's Line, this does not alter the fact that it has a community of interest horticulturally. I shall not attempt even to enumerate the peculiar advantages of this region in apple production; but I do wish to predict that within twenty years the Blue Ridge Country will be the centre of wholesale apple production in America, provided it is organized for co-operative packing and marketing, as a unit, and not on State lines; and provided further, that some very important present deficiencies in cultural methods are remedied.

I presume you have studied the fourteenth census and have derived some comfort from it. The fact that there are but 151,436,633 apple trees in the country now as compared with 217,114,688 trees ten years ago has some significance but not as much as might be supposed. The census shows a decrease of 23.8% in the number of bearing trees and of 45% in the number of trees not yet in bearing. A considerable proportion of the loss of bearing trees is due to the passing out of the old farm orchards of the northern states. These are mostly decrepit and neglected orchards of one to three acres on general farms and were planted between 1865 and 1878. They are not much of a factor in the wholesale market. Pennsylvania lost 4,000,000 apple trees between 1900 and 1910 and 1,000,000 trees between 1910 and 1920, but these were not in commercial orchards and the crop producing capacity of the state, of market fruit, is greater now than ever before. Most of the 12,000,000 trees that were lost in the states of New York, Pennsylvania, Ohio, Indiana, Illinois and Michigan during the past ten years were in non-commercial farm orchards and the crop producing power of these states, of market fruit, is practically unimpaired.

The states of the Mississippi Valley, however, have a different story. The three states of Missouri, Kansas and Arkansas lost 22,793,575 trees, or 60% of their total, between 1910 and 1920. Missouri alone lost 11,235,824 trees or nearly 70%. This shrinkage was mainly in unprofitable commercial orchards, largely of the Ben Davis. It removes a great body of trees from possible competition with this region in the wholesale market.

The pulse of the apple industry is the census report on the number of trees not yet in bearing. We have been amazed at the giant strides of our chief competitor on the Pacific Coast during the past fifteen years. The state of Washington has advanced to second place in number of trees and this year, 1921, to first place in production. It is a remarkable record—but will it continue? I think not. In 1910, Washington had 4,862,702 trees not of bearing age; in 1920, only 755,869. These figures reflect the sharp check in planting due to a series of unprofitable years. The apple industry in Washington has reached its peak. The census of 1930 will place it below New York, Virginia and Pennsylvania because the enterprise is more speculative there than here. Meanwhile, Pennsylvania, Virginia, Maryland and West Virginia have continued to plant in a conservative manner. They had 9,369,486 young trees in 1910 and 7,961,913 in 1920. This is a healthy growth and is altogether reassuring. The present rank in number of bearing apple trees is:

(1) New York 9,636,698 trees
(2) Washington 7,964,167 trees
(3) Virginia 7,385,277 trees
(4) Pennsylvania 6,981,128 trees

The rank in number of trees not yet of bearing age, however, is quite different:

(1) New York 2,932,281 trees
(2) Virginia 2,857,007 trees
(3) Pennsylvania 2,603,516 trees

Washington is not in the first twelve. In another decade, either Virginia or Pennsylvania will wrest the leadership from New York.

While many other sections of the country have been standing still or going backward in the apple industry, the Cumberland-Shenandoah Region has made great strides. I have not been able to secure the Census figures for the Virginia counties, but the West Virginia, Maryland and Pennsylvania counties of this region show an increase in the total number of apple trees, from 818,041 in 1910 to 2,339,123 in 1920, or practically 200%.

County	1910	1920
Adams, Pa.	165,999	534,583
Franklin, Pa.	178,827	340,435
Cumberland, Pa.	93,447	184,062
Washington, Md.	141,113	406,223
Berkeley, W. Va.	161,118	629,273
Jefferson, W. Va.	77,537	242,547
Frederick Va.	273,245	
Clarke, Va.	52,391	
Rockingham, Va.	240,872	
Augusta, Va.	354,013	

Altogether, the census of 1920 should be quite a comfort to any despondent apple growers of this Valley, unless they may feel, as I do, that we are growing just a little too fast.

I make a plea for an organized development of the apple industry of the Cumberland-Shenandoah region, as a unit and not on State lines. The apple growers in this Valley have a community of interest that would not be disregarded by any other group of business men similarly situated.

They sell the same commodity. I hazard an estimate that 30% of all the apple trees in this region are York and that 20% are Stayman.

They seek the same market. All are carlot shippers to the wholesale markets.

They have substantially the same problems of production.

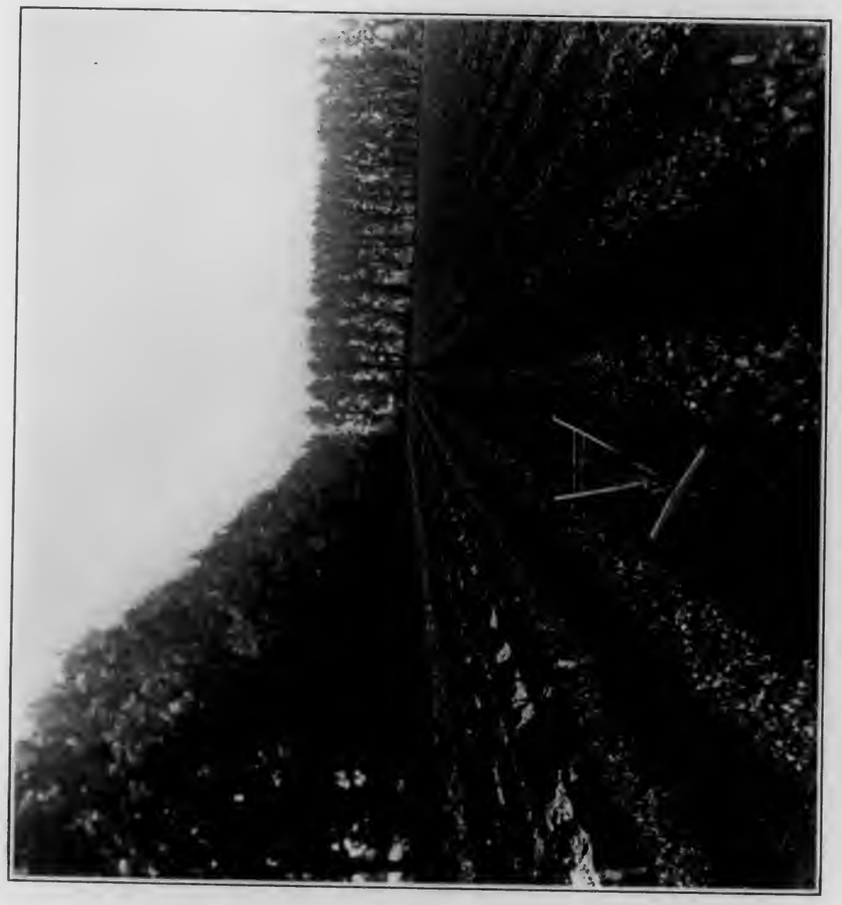
Yet in spite of these manifest reasons for co-operative effort, the apple growers of this Valley are practically unor-

ganized and compete with each other instead of uniting to meet competition from other regions.

The chief competitor of the Cumberland-Shenandoah Region is Western New York. The battle between the two for supremacy in the apple industry of the East will be won or lost, not on the respective advantages of the two regions in matters of production, but on their initiative in matters of packing and marketing. We have heard much of the benefits of organization in the West, now we may observe them close at hand. The marked success of the co-operative central packing house movement in Western New York has a most important bearing on the future of the apple industry in this region. The Western New York Baldwin, standardized in pack and advertised in brand, is bound to outsell our unstandardized and unadvertised York. Western New York has demonstrated beyond a shadow of doubt that in centers of close planting and considerable production the most practical method of securing a standardized pack is through the co-operative packing house; and the selling agency that handle the output of these thirty or more houses has demonstrated that this pack will command a premium.

Western New York fruit growers are conservative. Rarely do we see them chasing after horticultural will-o'-the-wisps. They have kept a pretty even keel for more than half a century of profitable apple growing. They entered into this phase of co-operation with many misgivings, arising from previous failures, but it has proved its worth. At last we seem to have found a method of co-operation that is workable in the East. It is based on the principle, which eastern growers have too long overlooked, that a product must be standardized before it can be merchandised. There can be no successful co-operative selling until the organization is able to guarantee the integrity of the commodity. It is extremely difficult, if not impossible, to do this when the fruit comes from many unsupervised private packing houses. This is the rock on which a number of promising co-operative enterprises in this Valley have split. I think it is safe to say that within ten years the affiliated central packing houses of Western New York will control more than 50% of Western New York apples and will put on a program of advertising and exploitation such as has not been seen in the apple industry this side of the Mississippi.

Will the Cumberland-Shenandoah growers be able to meet this competition? Not if the present policy of extreme individualism is continued. We may as well admit that no wholesale apple region in the country is more completely unprepared to meet organized competition than our own. We have a few good co-operative packing houses and there have been a number of feeble gropings in the direction of co-operative marketing, but for the most part the apples of the Cumber-



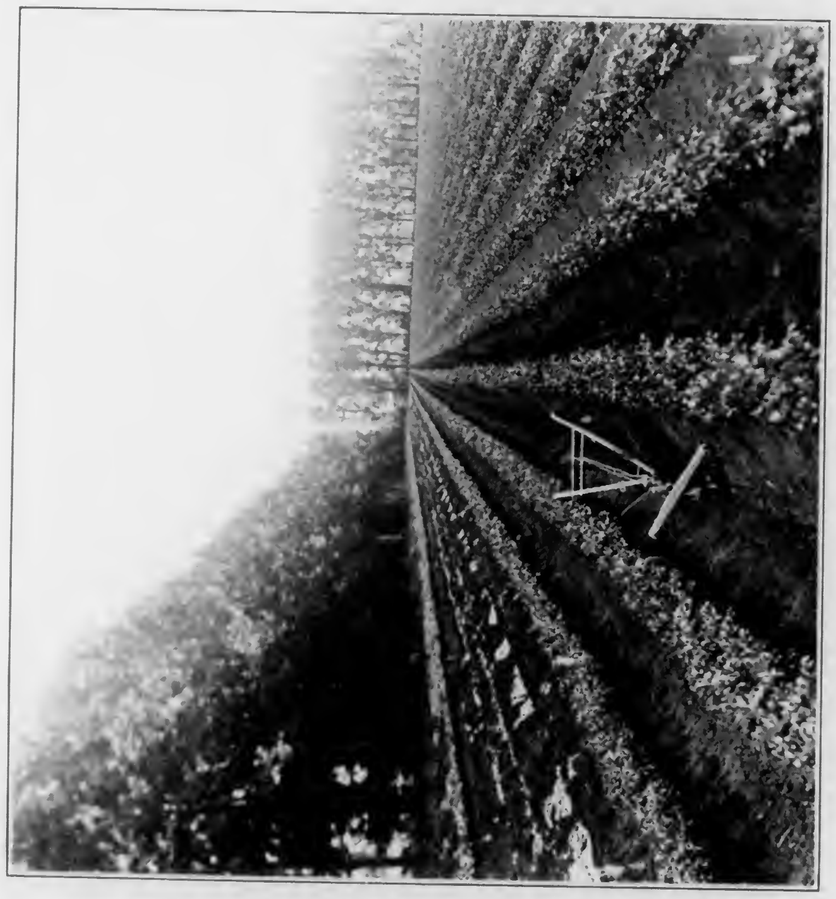
BANKING CELERY AT R. J. WALTON'S, HUMMELSTOWN, PA.

land-Shenandoah Region are packed and sold by the man who grew them. More apples are packed in the orchard than in the packing house. There are only fifteen packing houses in Adams County, fourteen in Franklin County, and six in Cumberland County and scarcely half of these are worthy of the name. In these Pennsylvania counties, with a combined planting of over 1,000,000 trees, less than 5% of the fruit in handled by co-operative organizations. Some of it is still sold by that most unsatisfactory of all methods—"on the trees." A majority of the growers are uncertain as to how their crops will be handled until the harvest is about to begin. A large number still sell their fruit "orchard run," not packed under commercial grades. Greater progress has been made in the Virginia and West Virginia counties, where the plantings are somewhat older than in Pennsylvania, but even there the co-operative spirit is pitifully weak.

This is the home of the York Imperial apple, yet we have no general agreement on grades for that variety, no program of publicity to increase its consumption, no means of securing effective distribution. The York Imperial apple grower of Frederick County competes in the open market with the York Imperial apple grower of Adams Couny as well as with the Baldwin apple grower of New York. We are bound by a pernicious individualism which blinds us to our own interests.

It is time for a change. The fact that most of our growers have been able to do pretty well in the free and easy past will not help them in the more strenuous future. Our proximity to the large markets will not save us from elimination if we cannot produce apples that may be as readily merchandised as Jonathan apples from Wenatchee or—to look forward a little—Baldwin apples from Western New York. We have a commodity that is worth the effort it will take to put it on a merchandising basis. Properly handled, the Cumberland-Shenandoah York can compete successfully with the Western New York Baldwin in any market, nor are we afraid to match our other great variety, the Stayman, against the best Delicious that ever came out of Wenatchee, provided we are able to guarantee our pack as they do theirs.

We need other facilities besides packing houses. Who will estimate our loss during the past ten years from unadequate cold storage space at the point of production? We need more canneries and other by-product plants. Franklin County, the second county in Pennsylvania in apple production, is practically without a local outlet for low grade fruit; it must be shipped out of the County. We need, above all else, a new spirit in our growers, a sober recognition that times have changed and that we must change our methods to meet them. The every-man-for-himself policy has come to the end of its



BANKING CELERY AT R. J. WALTON'S, HUMMELSTOWN, PA.

land-Shenandoah Region are packed and sold by the man who grew them. More apples are packed in the orchard than in the packing house. There are only fifteen packing houses in Adams County, fourteen in Franklin County, and six in Cumberland County and scarcely half of these are worthy of the name. In these Pennsylvania counties, with a combined planting of over 1,000,000 trees, less than 5% of the fruit in handled by co-operative organizations. Some of it is still sold by that most unsatisfactory of all methods—"on the trees." A majority of the growers are uncertain as to how their crops will be handled until the harvest is about to begin. A large number still sell their fruit "orchard run," not packed under commercial grades. Greater progress has been made in the Virginia and West Virginia counties, where the plantings are somewhat older than in Pennsylvania, but even there the co-operative spirit is pitifully weak.

This is the home of the York Imperial apple, yet we have no general agreement on grades for that variety, no program of publicity to increase its consumption, no means of securing effective distribution. The York Imperial apple grower of Frederick County competes in the open market with the York Imperial apple grower of Adams Couny as well as with the Baldwin apple grower of New York. We are bound by a pernicious individualism which blinds us to our own interests.

It is time for a change. The fact that most of our growers have been able to do pretty well in the free and easy past will not help them in the more strenuous future. Our proximity to the large markets will not save us from elimination if we cannot produce apples that may be as readily merchandised as Jonathan apples from Wenatchee or—to look forward a little—Baldwin apples from Western New York. We have a commodity that is worth the effort it will take to put it on a merchandising basis. Properly handled, the Cumberland-Shenandoah York can compete successfully with the Western New York Baldwin in any market, nor are we afraid to match our other great variety, the Stayman, against the best Delicious that ever came out of Wenatchee, provided we are able to guarantee our pack as they do theirs.

We need other facilities besides packing houses. Who will estimate our loss during the past ten years from unadequate cold storage space at the point of production? We need more canneries and other by-product plants. Franklin County, the second county in Pennsylvania in apple production, is practically without a local outlet for low grade fruit; it must be shipped out of the County. We need, above all else, a new spirit in our growers, a sober recognition that times have changed and that we must change our methods to meet them. The every-man-for-himself policy has come to the end of its

usefulness in the apple industry of this Valley, especially with a 200% increase in planting.

There is another leaf that we may well take from the experience of our seasoned competitor of the North; that is, the danger of over specialization. A large proportion of our apple growers have no considerable source of income except from apples. Comparatively few are able to survive two successive years of apple failure without serious discomfort. A survey made by the United States Department of Agriculture revealed that the average fruit farm of Western New York contained 118 acres, of which 14 acres are in apples, 20 in other kinds of fruit and 73 in farm crops. A recent survey of the apple industry in Pennsylvania showed that the average Adams County fruit farm of 135 acres has 45 acres of apples, practically none of other fruits, and the balance is in farm crops and woodland; while the average Franklin County fruit farm of 112 acres has 44 acres in apples. In these counties the percentage of total farm income derived from the sale of apples was 58% in Adams County and 72% in Franklin. The degree of specialization probably is even higher in the West Virginia, Maryland and Virginia counties of this region. No wonder our purses are flat after two lean years. Western New York fruit growers have not left the pinch so much because they have other crops to fall back on.

There is, of course, a danger in over-diversifying as well as in over-specializing. Furthermore, our location does not lend itself so well to the culture of other kinds of fruit and of vegetables as does Western New York. Nevertheless, it is beyond doubt that many of our people are plunging too heavily on apples. That is why the temperature of the apple industry in this region quickly rises to fever heat after a year or two of high prices, as in 1919, and sinks with equal rapidity to barely above the freezing point, as in 1921. During the same period the temperature of Western New York fruit growing has kept pretty steadily at normal blood heat. The apple business is mercurial and speculative at best; why make it more so by growing apples and nothing else? On very few of our orchard farms is it impracticable to grow some other special crop, such as alfalfa, navy beans, soy beans, potatoes or cabbage or the staple farm crops,—corn, oats, wheat and grass, together with a moderate number of some kind of livestock, particularly hogs or sheep.

We in this Valley are still youngsters in the national family of apple growers, having hardly reached our majority. It is fitting, therefore, that we should still learn a lesson now and then from our elders in the northeastern states. The lamp of their experience burns brightly beneath the adage, "Don't put all your eggs in one basket." If Missouri had heeded this warning, she would not be in such a humiliating position today, with a loss of 11,000,000 trees in ten years. If Washington had heeded this warning, she would not have been down in the depths in 1920, riding the crest of an evanescent boom in 1921, and facing an inevitable decline in the years to come. If the Cumberland-Shenandoah Region does not heed this warning, the enumerators of the fifteenth and of the sixteenth census will find many abandoned orchards and our prospective supremacy in the apple industry will pass into other hands. It is not necessary or desirable that we should pattern after Western New York, where the orchard is but one spoke in the wheel of diversified farming. It is certain, however, that the type of orchard that should prevail here is not the one so commonly seen now,—a farm of 50 or more acres of apples and little else; but a farm on which apples are the major source of income and the chief object of the farmers care, with enough other farm crops or live stock to carry the enterprise over the lean fruit years.

The outstanding needs of apple growing in the Blue Ridge Country are diversification, to stabilize the industry; and organization, to standardize the pack.

We need general agreement on grades, especially for the York Imperial and the Stayman, and an organized movement to promote co-operative packing houses wherever the acreage is sufficient to make the practicable. Some of the larger growers will, of course, continue to pack in private houses, but under Association rules and supervision. I have no idea whatever that co-operative selling, on a regional or even a county basis, is feasible now or will be for some years to come. Standardization of pack is the pre-requisite of co-operation. Let us attack one problem at a time. Out of the central packing houses will grow local co-operative selling organizations. In time, these may pool their interests in a central selling agency, as has been done in New York, but this is years ahead. Our immediate duty is to foster the most feasible means of securing a uniform pack throughout the York Imperial belt, so that a car load of A Grade Yorks may be the same whether produced in the orchard of H. F. Byrd at Winchester, Virginia, or in the orchard of D. M. Wertz at Waynesboro, Pennsylvania. This will create confidence among buyers and increase the demand among consumers. The road to this result leads by the door of the co-operative central packing house.

---

*Presented before the Franklin and the Adams County Horticultural Societies, and printed at the request of members of those societies.

MEETING OF VEGETABLE GROWERS' SECTION

Tuesday Afternoon, January 24, 1922
Chestnut Street Hall, Harrisburg, Pa.

The President, Mr. G. E. Smith of Allentown, Pa., opened the meeting at 1:30, and asked Mr. Houser of Dauphin County, to come forward and answer the various questions of the members concerning his excellent celery and cabbage, lest there would not be time later in the afternoon, and he did not want this opportunity for questioning Mr. Houser to pass.

Member: Where did you get the seed for your celery?

Mr. Houser: One year I found six stalks that were exceedingly fine, and I kept it because of the quality. I buried it along with the rest, and when I took it out I examined it, and found it was the finest green celery I ever saw. I planted that, saving it and growing it for seed, but I did not know just what I was going to get. What I did get was the finest celery I have ever seen, and I claim that it is the finest celery in quality and quantity that appears on the market anywhere. I am sure for quality it can not be beaten, and there are many here who will say so.

Member: How about the price?

Mr. Houser: I get a good price always for it.

Member: How did you get your cabbage?

Mr. Houser: The cabbage I crossed years ago between the Flat Dutch and the cone-shaped cabbage, one that I do not know, but from these I got the Houser cabbage. It is known today all over the United States, and they have been growing it at State College for some time.

Member: Are you still producing Houser seed?

Mr. Houser: Yes, but not very much.

Member: Where can it be obtained?

Mr. Houser: Mr. Burpee has the celery seed now. Mr. Holmes and Mr. Burpee got the seed that I grew myself. They have as good seed as I have, and I try it out each year.

Member: How about your soil?

Mr. Houser: Celery does better in a heavy ground than in light ground. In sharp sand you can not do well with celery. You can grow celery in any ground outside of sharp sand, but you will find that sharp sand won't grow celery at all. In Roanoke they can not grow celery, and they do not grow it because they can not. They do not have the right soil.

Member: Do you grow in rows or beds?

Mr. Houser: Altogether in rows.

Member: How do you fertilize?

Mr. Houser: I fertilize mostly from the top. Celery feeds from the top.

Member: Do you use any commercial fertilizer?

Mr. Houser: When I have manure I use manure and nitrate of soda, and sometimes potash.

Member: Do you do any spraying?

Mr. Houser: I never do any spraying. I did one year, and that year I did not have good results.

Member: Does your celery grow true to type?

Mr. Houser: It does, that is, the Houser celery I speak of.

Mr. Smith: Is that true each year? Is it better or worse?

Mr. Houser: It is about the same each year. It is very hard to keep anything up to standard. You must take the finest types each year to grow seed from it, or it will go back.

Member: About what class of celery would you class yours with?

Mr. Houser: It is a green variety. I sell the green celery, and I have plenty of people who want it green. Many physicians have come and asked me for the green celery. They claim it is better, that the taste is better when green than when bleached.

Member: Was it a pretty good size this year, the celery crop I mean?

Mr. Houser: Fine, I had a dandy crop.

Member: How close do you put your rows?

Mr. Houser: Three feet, and the celery eight or ten inches apart.

Member: Do you have any trouble with blight?

Mr. Houser: This year I had no blight at all. I attribute that to the use of nitrate of soda.

"OVERHEAD IRRIGATION"

By Hochberg Verona, Pittsburgh, Pa.

I was asked to give my personal opinion of irrigation. I will try to do that in my own way. It might be a little strange and interesting for you to know how and why I came to be here to speak on irrigation.

During the summer of 1916 myself and my family took an eight-day automobile tour through parts of Pennsylvania, New York, Canada and Ohio. During my trip I saw irrigation many times. At the beginning of the trip in New York we decided to stop at one place and see the method or irrigation. It happened to be a gardener's home, and when we told him we wanted to see what we could of irrigation, he was very glad to assist us. He told us all about his own irrigation system. He had a good crop, and there was quite

a difference between the irrigated and unirrigated crops which were to be seen throughout the neighborhood. After we left this district we drove on, and finally one very hot day we arrived in Cleveland at 4 P. M. We decided to drive out to the suburbs, as it was so very hot, and that evening drove out to what is called the Brooklyn district—quite a market gardening district. There we saw some fine crops and more irrigation. We came to a place that looked most inviting, and decided that here we would ask to look over the irrigation. We told them that we were market gardeners, and that we would like to see their place. They welcomed us, and we asked if we might stay for the night. They said we could stay if we would take what they had to offer. We stayed, and what we got was far better that we received at any hotel.

The next morning we looked over their irrigation and their neighbors', and they surely had some fine crops. The source of water supply was a pond fed by small springs and small creeks. They pumped their water directly in a line, which is quite a disadvantage in some regards. After a pleasant stay we left that place about 10:30 A.M. for Youngstown, intending to visit other irrigation systems, but when we found that we were only sixty miles from Pittsburgh we started for home, well pleased with our trip.

I can now lead up to my subject. After this trip I decided I needed irrigation, so I at once wrote to various firms about irrigation equipment, and in a few days got an answer from one of them asking about the water supply, lay of the land, etc. I replied that I did not have water, and gave the plan and lay of the land. In a few days I got a letter that under the circumstances the best thing would be to drill a well and have a reservoir. I immediately sent for the fittings, and made the reservoir. I next had the well drilled, all in about thirty day's time. By this time I had the pipe and fittings on hand and the reservoir completed. We then dug the ditches, laid the main line, and completed it and tested it out. When installing this system it will not be necessary to employ a plumber. There is no trick about it. Anybody at all can put up an irrigation system. As to the cost, the total cost of equipment for five and one-half acres for irrigation, not including my own and man's time was $1,611.90 At the present time, however, it would cost about double that.

The most important thing about irrigation is plenty of water, and I believe most of us do not realize the importance of water anyway. Do you know that vegetable plants are composed of about 90 per cent water? Drought is one of the worst evils with which the market gardener has to contend. With irrigation this is removed. Irrigation is also of advantage in transplanting plants. My own experience is that the dryer the year the more money I make. Of course, when we

do not have dry seasons, my neighbors laugh at me, and ask me how about my irrigation now, but even at that I manage to get my stock to market at times when they are suffering from dry weather. When others are grumbling of drought, I simply set my irrigation system to working and let it go at that. With irrigation you can grow from two to three crops per year without losing a day's time. $1,000 to $2,000 per acre can be made on crops that have been irrigated. Last year I raised $60,000 worth of celery, and we planted it all dry. We planted it without extra help, because we could plant at any time regardless of the weather. Now as to the amount of water to use in transplanting plants and small seeds, especially on clay land. I would say that I like to water morning and evening for two or three days, as it seems to give better results, but after the plants get well started a good soaking once a week is better than light watering every day.

I always water morning and evening rather than in the heat of the day.

With irrigation you can grow large crops of high grade goods, and get them to the market at the right time. Irrigation is crop insurance, I should say, and it has surely proven so to me. In conclusion I will say that the most money I ever made in one day was the day I decided to install my irrigation plant. You will understand that I have just touched the "high spots." If you have any question I will be glad to answer them.

Mr. Thomas Biddle, of Bustleton, Pa., was next called to follow up Mr. Hockberg's talk—

When going into the irrigation system the first thing is to study your land. Find out whether you have the right elevation, or right water pressure, and from what source you are to get it, and then lay your plans. Lay off the ground, and find out the quantity of pipe you will need. Different measurements of pipe are needed for different lays of ground. They must all be figured out before you attempt to arrange a system. We are very fortunate in this. We have a city water main running directly past our place, with a pressure of about fifty pounds, sometimes seventy pounds pressure. We have approximately fifteen acres under irrigation. Our water bill is the minimum of $290 a year. I doubt if we have this last five or six years used half of the amount of water allowed us. We do not use our system constantly. The first year or two that we had the system we irrigated too much, and we found that the best results were obtained from an irrigation system if you can forget you have it, and then remember it only on days that it is absolutely necessary, when drought comes. We do not constantly sprinkle, and we recommend against it. I am speaking of heavier root crops such as

beet crops, celery, etc. As long as your plants are growing all right, keep right on forgetting that you have an irrigation system.

Another great benefit from irrigation in the fall of the year about the 12th of October or so, a killing frost may come on you, and if you can melt that frost before the sun gets on it in the morning, your chances of saving your crop are good, because it is not the frost but the sun on the frost in the morning that causes trouble, and irrigation will knock that off. Of course, you run chances of burning off some. e

Irrigation has its drawbacks too. Many years it will not be best or necessary to irrigate, but sometime you will strike a day when it will make good. It is really an insurance of the crop, but many men have spoiled a good crop by the over use of the irrigation system. Now if you will ask questions, it will be best, as I can possibly give you better advice in that way.

Member: Is there any more danger of blight under irrigation?

Mr. Biddle: We have as much blight as anybody, but that is our own fault. It got in the ground, and now it is up to us to get it out. The chances of blight are no greater under irrigation than with any other system, but if you misuse irrigation your chances of compulsory spraying are greater. The blight of celery only spreads by moisture and water, but your chances of blight are not any stronger under irrigation than without. The chances of spraying are though.

Member: What do you mean by the misuse of irrigation?

Mr. Biddle: I might specify, by continually using irrigation and not spraying at all. If you want good celery you must keep the sprayer going.

Member: What do you use, spray or dust?

Mr. Biddle: Spraying. I like the homemade best. I went back to bluestone and lime, and there I am going to stay.

Member: What pressure do you have?

Mr. Biddle: Fifty to seventy-five pounds, varying with the drain of the system from other people in the locality.

Member: How do you set a field of lettuce in dry summertime and not cake the ground?

Answer: In my case we find that lettuce requires very little moisture to germinate it. We miss once in a while, but very seldom without having lettuce up in five days.

Member: Can you do that without caking the ground?

Answer: Yes, of course, it lies a good bit in the nature of the ground.

Mr. Smith: I want right here to change the subject a little. There are numbers on this program that I would not miss for two dollars. Our dues are two dollars. We have

membership cards and will distribute them at this time, and everyone who pays and joins us will get a button. Now do let us put this association across in Pennsylvania. Let us pay for this thing and stick to it. Nobody gets any money out of it, and it is worth more to you than the two dollars. Surely you know it is worth two dollars for the information you get. We want to make a record for starting these meetings promptly and ending them promptly, and also we want to make a record for membership. We will now go on with the program, and please note that we are running on schedule time this year. We want to do that every year hereafter. I want to introduce Mr. Sheldon Funk of Boyertown, Pa. You all know of his father, now we will hear from the son.

PERSONAL MARKETS

By Sheldon Funk, Boyertown, Pa.

If the Chairman will permit, I would like to change my subject a bit. It was to have been "Roadside Markets." Mr. Smith wrote me sometime in the summer relative to saying a few words before this meeting, and I replied that I would be here, and I did not hear from him until just a few days before the meeting, and I was a little bit surprised to read that I was on the program to speak on "Roadside Markets." I do not want to speak on that subject for the reason that I do not do any roadside marketing, and I want to talk on something that I am more familiar with.

I believe there is a splendid opportunity for roadside markets, and I intend to develop that end of it in my own work within the next year or two, because I feel that I am going to have a lot of peaches that can be handled better in the orchard, and I want to try to bring that end of it out before long. I find that with little trouble we can get automobiles to come and take it from the orchard. But we have practiced marketing direct to the retailer, and that is what I want to take up this afternoon. I know something about that subject.

I believe that the most satisfactory way of handling vegetables where it can be done. Pennsylvania is the best place in the United States to market direct to retailer, because we have more and better retail markets in Pennsylvania than any place in the United States. Any person familiar with conditions knows this. Then, again, Pennsylvania has one-tenth of all the people living in towns and cities in the United States. We might say that one-fourth of all the people in the United States live in Pennsylvania or in states that surround it. Again Pennsylvania has far more towns ranging from 2,500 to 10,000 in population than any state in the Union, and that is one

great big reason why we have less success with co-operative associations, because we have so many markets at our doors. For that reason, and because I found it most satisfactory, we are handling our goods by a system of marketing direct to the retailer. But a number of things are necessary.

First of all, we must study the markets. I have found in my own experience there is a lot of difference in the markets. I can give one splendid illustration. The City of Lancaster is the highest priced retail market in Eastern Pennsylvania, while, on the other hand, the City of York is the lowest priced retail market, and still it is only seventeen or eighteen miles from the first named city. Reading it not a good vegetable market. I have found out all these things by experience. The closer to Philadelphia you go the poorer is the vegetable market. This is because Philadelphia is the dumping ground for Jersey vegetables. In Reading you must study your crops well.

Member: What do you mean by retailing direct?

Mr. Funk: To the stores. I ship direct to green grocers, or deliver to them.

Member: Not to the retail trade?

Mr. Funk: We wholesale to the retailer.

Member: Have you ever tried selling direct to the consumer?

Mr. Funk: It pays, but it is very hard on a man's religion. You have too many different dispositions to deal with. You have as much trouble selling a basket or bushel to the consumer as a car to a retailer. Also, it takes too much time.

Member: Have you ever stood in public market?

Mr. Funk: Yes, but I don't like it. You have to get up too early. In Reading the market opens at four or five o'clock in the morning. Many people find it very satisfactory and profitable, however. I have neighbors who make a success of it.

Member: Outside of getting up early did you find it satisfactory?

Mr. Funk: I have really not had enough experience along that line, but it seems to pay very well. I do not think they can handle as large a quantity of goods, and it certainly takes more time to handle the same amount. The closer you get to the consumer, the more time it will take; the farther away from him you are, the less time it will take to sell goods.

Member: Don't you have difficulty in finding retailers?

Mr. Funk: The most essential thing, as I see it, is to grow good crops, the best you can grow. I have always found that it is not difficult to sell something good, but it is very hard to sell something that is poor. I think that the fundamental point in the whole business is the growing of a good article. The next thing, and the one that is most difficult in

my work, is grading and packing. As long as I can superintend the grading myself, I very seldom have any trouble, but as soon as I let someone else at it the trouble begins. My own experience shows me that unless you work at this business with the other fellows, you are not going to get far. I know what the people want, and as long as I give what they want, I have no trouble, but if I allow someone else to pack without my supervision, there is almost sure to be trouble.

Also, unless we grade carefully we have trouble. I like to pack everything so that it reaches the retailer in the best of condition. I also have found that it pays to grow a rather large list of vegetables, that is, grow something throughout the season—not the same vegetables, but so you have something to ship to the retailer all the time, or as nearly all the time as possible to do so. Another thing that is very important is to have the confidence of the men you are dealing with. That I believe can not be urged too strongly.

I very seldom call up for an order. Frequently I won't hear from the dealer for two or three months, except when I go to collect bills. Of course, if I have some corn or tomatoes, or something that is coming, I call up, or get to see them, and tell them that I am expecting so much at such a time. "All right, when it comes in, let us have it" is invariably my reply. If I have three hundred dozen sweet corn I divide it between the different dealers, and ship it to them, and put the price on it, and the next day I do the same thing, and send it the next day, and I keep on shipping throughout the season. I usually see them once or twice a week in shipping season, or not so often when I am not in a shipping season that is very busy. They must have confidence in me, or they would not let me ship what I have and put a price on it, but they know that I am not going to let them stick. I always make it right. I do not want to see any of those men lose a dollar that I could prevent, and for that reason instead of calling me up if I am charging them $1.25 a basket for tomatoes, when they are only selling for 75 cents, and telling me to stop shipping, they know I will make it all right, and they allow me to go on shipping. If I find that I have too much over, or things are not moving as they should, I call on them, or if they get too much, they will call me up, and tell me to stop, and then I sell to commission men if it is worth while. If you sell to commission men you may get a good price, and you may not.

Two years ago you know that cabbage sold all summer at 50 to 75 cents a berrel. No money can be made at that. Maybe Jersey men can do it, but we can not. Cabbage is worth $2 a barrel to me, or it is not worth anything. I did not sell a barrel of cabbage under $2. At 50 cents I would have lost money, but at $2 I came out all right.

Member: Does the dealer like you to put on a price in that way?

Mr. Funk: The dealer does like you to put a price on. When I ship anything in, and do not have a price on it he wants me to put the price on, then they know what they should try to get.

Member: Do you have any trouble in collecting your bills?

Mr. Funk: As far as collecting bills is concerned I try to get them in every week or two. I have very little trouble. Some want to pay cash, others want to be carried on. I like both kinds of men, the ones who pay cash and the ones who are carried along. The fellows who pay cash never want to pay as much as the ones who want to be carried on a little while, and I carry them as long as they are willing to pay for it. My experience is that they are willing to pay for it, and I have lost very little in either way. Of course, the fellow who pays cash kicks if he thinks the price too high, but the fellow who does not pay cash is willing to pay for the privilege of being carried along.

Member: How do you fix prices?

Mr. Funk: I have one or two men whom I can trust, and I call up for prices, and they tell me just what they are paying.

Member: By your method do I understand that you never lose anything?

Mr. Funk: Sometimes I lose a little something, but this year I don't believe I will lose anything—it is never much.

Member: Are you the only one in Reading shipping in this way?

Mr. Funk: In Pennsylvania there is no place that you can not market as I do. In Reading I am one of about one hundred or two hundred. Reading, as I have said, is not a good vegetable market. Too many vegetables come in there. I can get a higher price on fruit. Another thing—I can always get a better price from the man who does not go to Philadelphia. If I deal with a man who makes two trips to Philadelphia every week, I do not get as much money as from the man who does not go to Philadelphia. Philadelphia is the dumping ground for Jersey, as I have said before, and it effects the prices in our section very much.

Member: How do you ship?

Mr. Funk: I ship most of my vegetables by trolley freight. I can use auto trucks, but I can ship by trolley freight a great deal cheaper. We have three freight a day, and the men seem willing to get the produce at the freight house and haul it home. They know they are getting good, fresh vegetables, and they know that the price will be right, and they

know they will not be "stung," because if the price is too high, we make it all right.

Member: Do you make any difference in the kind of produce sent to the man who pays cash?

Mr. Funk: You will find that in different sections the price will vary in the same city. That is bound to happen. In some parts they pay well for the best, and in others they pay a little less and are willing to accept produce that is not quite as fine. The fellow who pays the price gets the best fruits and vegetables, and there are always some who want the best.

Member: To the man who takes a large quantity do you make a special price?

Mr. Funk: Yes, I do.

Member: Do you not think that is a detriment in the same town—the variation of price?

Mr. Funk: No, when a man buys more, the price is less. If a man will agree to take so much, I make a little difference. In this way if I am glutted up they will strain a point to help me out. Some of them pass it on to other people, and they pass it on in that way to two or three more, and help me out. We help each other out.

You must give these things your personal attention, and if your business gets too big in the retail trade you can not give it your personal attention. In a business from ten to twenty thousand dollars a year you can handle it personally.

Member: Do you grade vegetables the same as fruit?

Mr. Funk: That is as hard as anything we do.

Member: I suppose the retailer does some grading too?

Mr. Funk: One thing I would like to mention here. I do not believe in "knocking" the retailer, as a lot of men seem to delight in doing the last few years. You hear of the retailer getting rich. Some of them may be, but the majority are not rich and are not getting rich. I am well acquainted with a lot of them, and they are not making very much. At one of the best stores in Reading the owner told me his profits were not $50 a week. He states that he can go to work in a nearby mill and make more than he can in his store, and I believe him. Think of that, and you will understand that they are not all growing rich.

Mr. Smith: We are all glad to have these views on marketing. and they are certainly helpful to us. After we have had a few words from Mr. Byers of the State Chamber of Commerce concerning the reduced railroad tickets for return home, we will hear from Mr. W. B. Nissley of State College on "The Results of a Better Seed Campaign."

REPORT OF A BETTER SEED CAMPAIGN FOR 1921

The major activities of the year were centered on demonstrating the value of and locating better seed for the vegetable grower. There is no other factor entering into economic production that is as important and profitable to the grower considering labor and money expended as the use of well selected and well bred seed.

As a result of similar demonstrations last year there was bought this year by growers about six hundred (600) pounds of the best cabbage seed that could be secured which planted about two thousand acres. This may not seem unusual but when we take into consideration the fact that the growing conditions this year were poor it was demonstrated that the recommended source of seed produced a fair crop when prices were high and poor seed in many cases did not head at all or produced a small yield of poor quality.

Cabbage: During the past season six (6) demonstrations were conducted in as many counties using ten (10) sources of Copenhagen Market Cabbage Seed. The following tabulation shows the difference between the best and poorest sources of seed:

	June 25	June 31	July 8	July 12	July 15	July 22	July 26	Total
Best	5% cut	35%		40%	20%			100%
Poorest				20%	2%	10%	50%	rest not 82% marketed

At market price the best source of seed was over one hundred per cent (100%) more profitable than the poorest source. Although the latter produced more wieght.

	June 24	July 1	July 5	July 8	July 12	July 19	July 26	Total
Copenhagen Market	4 heads	21	3	1	13	6	0	Total 48 out of 50
Early Jersey Wakefield	6	13	11	9	7	1	2	

A comparison was made between Copenhagen Market and Early Jersey Wakefield using five (5) sources of each. The following tabulation shows the relative earliness between the best source of each.

Most growers claim that Early Jersey Wakefield is earlier than Copenhagen Market but our work shows that there is an early and a later strain of this variety and if the early strain is used there is no noticeable difference.

Twelve (12) demonstrations of Danish Ballhead Cabbage were conducted in as many counties and the outstanding

source was again the same as last year. One source of seed was worthless as it did not germinate ten per cent (10%). In some of the counties the yields ranged from nothing to 21.9 tons per acre. This average indicates a money value of from nothing to $650 per acre.

Tomatoes: In tomato work nine (9) sources of early varieties were compared and two (2) sources of main crop varieties. Included in these was one (1) selection of Earliana put out by the Pennsylvania State College which outyielded the nearest competitor by one-third. The appearance and percentage of firsts over culls was also noticeable. Two (2) main crop varieties originating also at The Pennsylvania State College showed wonderful possibilities and will be used statewide next year.

Member: Would it be of any benefit to treat spinach seed for blight?

Dr. Dixon: The thing to do is to plant resistant varieties.

Mr. Nissley: What we are trying to do is to locate for the vegetable growers of the state the best sources of seed. When you look through catalogs many are at a loss to know which are the best. We have found that the man who had the finest early Copenhagen seed had the very poorest of some other varieties. There we have the same vegetable (cabbage) and two different varieties, one good, one very poor, so we can not say that anyone is best for all seed. We have not arrived at definite conclusions. With due respect to our seedsmen I will say that they are doing the best they know how. The best advice we can give with any seed is to urge you always to get the best that can be obtained.

Mr. Smith called for the adjournment of the meeting promptly at 4:30 P. M.

LOCAL ASSOCIATIONS

By C. W. Waid, Columbus, Ohio

There has been a tendency among the vegetable growers of many of the states to believe that by forming a good strong State Association they might be able to solve many of the problems with which vegetable growers are confronted. I do not wish for a minute to throw any cold water on state organization movement. However, it is my judgment that we have been too much inclined in the past to build from the top down. The few state associations which have been formed have no doubt been of value to the membership. However, I think they might have been of still greater value had they been built upon a more substantial foundation.

The success or failure of any large organization depends upon the character of the material with which it is built. If it can be builded on a large percentage of representative men, it will be much more substantial than if there are only a few who are a part of this organization. It has proven to be practically impossible to secure and maintain a large number of members in a state organization through individual memberships. Efforts have been made at various times to work out some plan whereby local associations of vegetable growers could be federated with the state association. This plan has merit but its weakness seems to be that the local associations either do not feel the need of the central association or that the number of them is not sufficient within the state. The ideal plan for strong efficient organization would be to have each community thoroughly and effectively organized and these communities federate into a state organization and the state organizations into a National.

In view of the fact that we have not been entirely successful in trying to build up a strong National Association and a few strong state associations, it would seem to me that the time has come for us to build on a somewhat different basis with the hope of greater success. There are a sufficient number of local problems in every community where there are quite a large number of vegetable growers to warrant the formation of a local association made up of these men. A local association usually appeals to a group of vegetable growers for the reason that they can see their own problems and can see the result of the work of their association and do not need to blame anyone else but themselves if their association does not function properly. In other words, it is much easier to organize a group of men for the purpose of encouraging them to work together locally than it is to try to get them to become a part of a larger movement the activities of which are very largely out of their sight and over which they apparently have little control. However, when ever the question of the formation of a local association is raised there is one answer which should always be apparent, that is, that there is a need for such an organization and that the growers realize that need. There is no use organizing a group of men for the simple reason of having them organized. The need will, of course, vary in different communities and there are few communities but what have some problems to be met. The chief difficulty is to get the growers to realize that they have problems and that these problems can be solved through an organization.

The different problems to be met will call for different types of organization. In some sections the growers will want to organize for the purpose of selling their products or for buying supplies, in others, the chief advantage of organization

will be along educational lines and in still others, the social features will appeal to the men most. All of these types of work may be needed in a given community but the social and educational are needed in nearly every community.

Type of Organization

The organizations should be made up in such a way that any services which may be needed can be done through the organization. If the members plan to sell their products collectively, they will usually find it to their advantage to form a corporation. If they incorporate they should be governed by the laws of the State having to do with such organizations. In Ohio, for example, a law was passed several years ago setting up the frame-work for a co-operative producers association. One of the outstanding features of this law was to permit the limiting of the liability of the membership. On the other hand, no adequate provision was made for protection against prosecution under the Anti-Trust Law. Quite recently the Legislature passed a supplementary law which is supposed to protect the producers against prosecution. Through the effort of the Attorney representing the Ohio Farm Bureau Federation, it has been made possible to combine these two laws and to give to each corporation the benefits of both laws. In other states, no doubt, somewhat similar laws are in effect.

A corporation, while primarily a business organization which can sell and buy, sue and be sued, at the same time can be so constituted that the educational needs of the membership can be taken care of through this same organization. In fact, there is nothing to prevent social activities in such an organization. As a general practice, however, it is more common to have the educational and social activities carried on independent of the selling work.

Duplication Should Be Avoided

There is no excuse for the formation of a local association of any kind where the necessary work is being done in a satisfactory manner, by an existing organization. In fact it is sometimes much better to have an organization which is in existence take on more work rather than to create a new organization.

Uniform Plan

All locals should be organized on a flexible uniform plan to permit them to unite and form a central organization if such an organization is desired. The central organization may be state-wide in its scope or even inter-state-wide, or it may include only one section of a state. This is particularly important where there is buying of supplies or selling of pro-

ducts to be done. By increasing the volume of business, the per unit cost can be proportionately reduced.

City Markets

There is probably no more outstanding problem before the vegetable growers of this country than the one which has to do with the selling of the vegetables in nearby cities. It has been customary in a very large percentage of the cities of large size to establish city markets. These have been of a somewhat variable type but in most cases there has been an arrangement whereby each grower was permitted to sell his own products from a stall for which he paid rent. This plan has been fairly satisfactory in some instances. However, the tendency is for the city authorities, especially when the city is run by politicians, to make changes more or less frequently without consulting the growers and sometimes without very much effort apparently to take the growers interest into consideration. This tendency on the part of the city officials to be independent has caused friction in many cases. Then too, the growers are gradually coming to realize that this method of marketing is altogether too expensive. They are also beginning to appreciate the fact that no other group of business men ever attempt to do business under as adverse conditions as vegetable growers try to sell their products on the city streets. Of course, when the weather is good it is not so unpleasant but there is a great amount of bad weather to be encountered and in most cases the grower must leave home at an early hour and be deprived of an adequate amount of sleep and for a portion of the day-time is kept away from his work at home. It is difficult to estimate the loss which is sustained by many growers because of their absence from home at certain hours. If this loss was added to the actual cost of marketing, most growers would appreciate the fact even more than they do that street marketing is an expensive method of marketing.

No doubt it will be a long time before we get away entirely, if we ever do, from this street or stall market. However, the large growers in many sections and in many cases the smaller ones too, are turning over in their minds the idea that sooner or later they will be buying or leasing a market site constructing their own building and hiring their own selling force. This plan is being worked in one or two places in this country at the present time and I am of the opinion that in the next ten years a great many cities will have markets owned or leased by the growers and operated by them collectively. The fact that the growers have been so accustomed to working independently will have a tendency to retard the progress of this movement. On the other hand, every

organization or group of men which makes a success of collective selling will encourage others to try to do like-wise.

To summarize the entire situation briefly and to emphasize the outstanding features may we say that the greatest need today is for the formation of local organizations built along the line or lines of local needs; that these organizations be so made up that federation of many of them will be easily accomplished. When the time comes that every community of vegetable growers is properly organized and those which can profitably do so are federated, we will find that state and national associations of vegetable growers can be organized and maintained on an efficient, representative basis and that they will become a power, not only for the good of the vegetable interests of the country but for all classes of people as well.

COVER CROPS

By C. M. Smith, Lewistown, Pa.

I cannot understand why the Program Committee should elect one of the largest gardners of New Jersey, and one of the smallest gardeners of Pennsylvania to talk on the same subjects. In comparing the amount of ground he has to mine, and the time of one hour alloted to us for discussions, they should give him 58 minutes time and myself two minutes time for discussing the topic of cover crop. After hearing Mr. Minch talk cover crops and myself called to talk on the same subject, reminds me of a story of an Irishman that got a job as Brakeman on a Pennsylvania passenger train. The conductor explained that his duties would be to help call out the names of the stations. The conductor says that he would call out the name of the station in the forepart of the train, and that Pat was to call out the same at the rear of the train. After leaving Harrisburg their first station was "Rockville." After the conductor called out "Rockville" on the forepart of the train Pat went to the rear and said, "The same at this end." After hearing Mr. Minch I will say that it will be the same at this end.

It will take me only a few minutes to tell you all I know about cover crops. I will endeavor to tell you how I was compelled to resort to cover crops for my sole source for organic matter for my garden. Situated as I am in the central part of the state on op of a very high hill I get the climate of our northern counties of the state.

Its about ten years since manure from the town has been available. My next resort for manure was to put sufficient stock on my ten acres to produce enough manure for my

garden. In order to grow roughage for my stock I resorted to the following cover crops: rye, vetch, alfalfa and sweet corn. I was not able to grow sufficient roughage. I was compelled to buy a great deal. I bought all of the concentrated feed. Now this was not only expensive but it required a great deal of labor throughout the year to care for the stock.

At one of the Vegetable Growers meetings held at the Board of Trade Building in this city, there was a statement made by one present that he heard of a Gardener up in the state of Massachusetts who had not used any stable manure for the past fifteen years. He kept up his soil fertility with cover-crops. This was a new thought for me. I wondered why I could not do the same. Now it was very easy to get along without the cows on the place, but how about the horses?

As there had been no tractor on the market for the small gardener, I heard in attending a Farmers' meeting at State College, Dean R. L. Watts had as his topic "Power for the gardener," and he said that he was optomistic as to whether their would be a tractor made suitable for the small gardener.

And after attending different tractor demonstrations throughout the state, there was none shown suitable for the small fellow. In conversation with a tractor agent I told him of the fact. He said, "He knew of a tractor that was about to be put on the market that was intended for the market gardener." I placed my order for one. It was the first to come to Pennsylvania of its kind. I hitched it to my two way riding plow and at the close of the first days plowing I disposed of a pair of horses. I kept one horse to cultivate in the close planted vegetables. We use beside the two way plow a Forkner Orchard harrow and also a riding cultivator. All riding horse implements and doing the work with more satisfaction and pleasure than a team of horses could do it.

Question: What make of tractor have you?

Answer: Allis Chalmers. And now in relating the fact to a general live farmer. He as much as said that I may as well commit suicide, as I would not be able to keep up the soil fertility.

Now as to the cover crop used; I tried out crimson clover. but winters are too severe, and it often freezes out. I used to use rye alone. But about eight years ago we started to use winter vetch, with the rye. Now there is no better cover crop than rye and vetch. But yet rye does no good sown too early and to sow vetch alone you would have to use a disk before it could be plowed down. In company with the Horticulturist Tour of New Jersey several years ago we stopped with E. A. Sexsmith near Asbury Park and he made the statement that he had not used any manure on his thirty-two acre

plot for the past eight years. He said, he was using as his cover crop sweet clover and the Mammoth Red, rye and vetch.

Now I tried the sweet and mammoth clover on my soil and found that the sweet does the better of the two. At the present time I use sweet clover in all crops laid aside up to the 15th of August.

Question: How much do you use?

Answer: Ten to fifteen pound to the acre. From the fifteenth of August to the first of October I use sweet clover, rye and vetch.

Question: How much per acre?

Answer: 5 pound sweet clover, 15 pound of vetch and 1 bushel and a half of rye per acre. After the 1st of October I use rye and vetch alone. Ground that I wish to plant to early cabbage, and tomatoes, and potatoes, I try to plant early sweet corn the previous season, and as soon as ears are plucked for market the tractor goes in the field and turns under the standing fodder. The ground is then sown to sweet clover, rye and vetch, and with the addition of one half to a ton of fertilizer I am able to grow very good crops without the use of stable manure.

FLOWER AND VEGETABLE COMBINATIONS FOR THE GREEN HOUSE

By S. H. Murphy, Kennet Square

Tomatoes

For several years I have used a rotation of tomatoes and chrysanthemums. Sow tomato seed about October 25th and grow the plants in a temperature of about 50 d. at night, higher of course in the daytime. With this treatment they will be ready to pot about Christmas and ready to plant in the bed about the first of February. I do not think they should be grown any faster during the long nights and dark days of midwinter as light is essential to healthy plant growth and too much heat without light will give you a weak plant.

Before planting, give the beds a good coat of manure which should often be changed. Use horse manure once, then sheep manure, tankage, pig manure, etc. Work the manure into the soil, then plant tomatoes 18″ x 18″ apart. When plants are 15 inches high, string them with binder twine to a wire stretched over each row and about seven feet from the ground. As the plants grow, wind the string around them and remove the side shoots throwing all the strength of the plant into one stem. Remove some of the lower leaves from time to time to admit light and air. As soon as blossoms appear fertilize them every bright, sunny day for unless the pollen comes in contact with the pistil there will be no fruit.

Sun and wind will do this out door, but the sun and you must do it inside.

Question: Do you sterilize the soil?

Answer: Yes. I did so in 1915 but not since then and am using the same soil. Like all hot water heated greenhouses, I have no facilities for generating the amount of steam needed for this work. Since that time have tried out the plan of growing tomatoes half the year and chrysanthemums or sweet peas the other half and by changing fertilizers for each crop, as well as treating the soil before planting each with lye or caustic soda—one pound to 400 feet of bed surface, have up to this time kept the soil free from Club Root or other soil troubles.

Question: What variety do you grow?

Answer: Comet. While it is a small tomato, it is of a form and color liked by the city markets of New York and Boston where my crop is marketed. Have tried out several other varieties. In 1921 I grew some Globe but both markets did not want a purple tomato. It did not yield as many pounds for the space occupied and I shall grow the Comet in 1922.

Question: How do you control the white fly?

Answer: By removing from time to time the lower leaves on which the nits or eggs are deposited and with poison gas for the adult fly. Put 4 ounces of water in a tin can or any other small vessel. Add 2 ounces sulphuric acid, and to this add 1 ounce of cyanide of potassium. This makes a gas fatal to any animal or insect having lungs and will get any of the so-called sucking insects but not biting insects like worms. If used too strong will also burn the plants and it will be best to have someone familiar with it to instruct you in its use the first time.

Question: Where do you get your seed?

Answer: Save it from the best and strongest plants having the largest number of good tomatoes. I think good seed is of the first importance as I have never grown a good crop of tomatoes under glass from seed selected as I have just outlined. I believe that tomato blight, our worst underglass trouble with this crop, is to a large extent carried in the seed and when anything but the very best seed is used and the plants are weakened by high temperature and rapid growth, blight is likely to result, especially when the plants have a sudden chill or set back of any kind.

Chrysanthemums

Chrysanthemums are the crop I am using at the present time in my rotation with tomatoes. The young plants are not grown from seed but are propagated from shoots of the same plant. The roots from last year's flowers will throw up new

growth and about February we begin to make cuttings by taking the tips of this new growth and planting them in sand and in about a month they will make roots, when they are taken from the sand and planted in soil and carried along until planting time.

The plants that were rooted early will most likely grow too large before time to plant them and to avoid this they are stopped by cutting the top out of the plant (which can be rooted in sand) being careful to leave several joints or eyes below the cut and the plant will shoot or break from these eyes and these shoots make the lower stems. Time of planting will depend on the variety, early or late, and when the space is available for planting. This must all be carefully considered beforehand.

I prefer to plant the rows 6 inches apart and 12 inches in the row, simply because it gives a better chance to work among the plants when they are still small and allows the same space to a plant as if they were panted 8 x 9 inches as is usually recommended.

I think it pays to grow two stems to a plant rather than one, as many recommend, as you can get two very nice flowers from one plant while single-stem plants very often run more to stem than to flower.

When the plants are 10 inches high, stretch a No. 18 wire on the outside (both sides) of the bed and between each row. Put these wires about a foot from the ground, then tie strings on each side of the rows across the bed. This will form squares, through which the plants should be trained in order to hold them upright and keep the stems straight. If your plants make good growth, you will need another set of wires and strings about a foot above the first. This answers the same purpose and is much cheaper than tying each plant to a separate stake.

As the plants grow, the side shoots must be removed the same as with tomatoes, and when the plant is ready to bloom it will send out a number of buds, all of which must be removed except one. It is to produce the flower for which you have worked for nearly a year.

The Chrysanthemum has many insect enemies; one of the most presistent being the Black Aphis which can be controlled with the tobacco extracts or cyanide of potassium. Worms, caterpillars, and grasshoppers will have to receive hand treatment.

Sweet Peas

Sweet peas are a very satisfactory crop to grow under glass in rotation with tomatoes; the peas using the space

from September until Easter and tomatoes planted as soon as possible after Easter for an early summer crop.

It is claimed that the pea vines store nitrogen in the soil the same as clover and that it is in available form for use by the tomato plants.

The sweet pea being a hardy plant, is grown cool, 45 to 50 at night, until it begins to bloom when it needs righer temperature. In planting the seed it is considered best to plant them first in sand in boxes for a few days until the seeds sprout when they should be taken out of the sand with sprouts ¼ to ½ inch in length. At this stage there are no roots. You are sure of an even stand of plants. Make the rows five feet apart and five inches in the row. As the plants grow they must be supported in an upright position. This is important at all stages of growth for if the vines are allowed to become crooked the flower stems will also be crooked and you want long straight stems on the flowers.

They are usually supported by setting stakes of 1" x 2" material or 15 feet apart in the row and string twine from one stake to the other, letting the plants grow between the strings. As the growth become heavy, it will be necessary to use a wire occasionally in place of the string to support the vines. They require very little labor until in bloom when considerable help will be needed to cut, sort and bunch the flowers for market.

About their worst insect enemy is the Green Aphis. They can be controlled with tobacco preparations but don't use cyanide of potassium on sweet peas. It will burn all the young growth.

A low greenhouse is not suitable for sweet peas as the vines will grow from 8 to 12 feet high and it is poor policy to let them down as they are likely to break off and equally poor policy to let them grow against the glass as then the stems will be crooked.

As sweet peas can be grown with very little heat and less labor, they are usually a profitable crop.

VEGETABLE COMBINATIONS FOR GREENHOUSES

By W. H. Weinschenk, New Castle

It is often desirable and profitable to raise a combination of crops in a greenhouse when a variety of vegetables are wanted to supply a local market.

In order that this may be done to secure maximum results, a combination requiring similiar temperatures and conditions should be selected. This is all the more imperative during the dull growing period from October to January dur-

ing which season there is not much sunshine. At this time it would be useless to attempt to grow crops requiring high temperatures such as cucumbers, tomatoes and New Zealand Spinach, which require 60 degrees night and 75 to 80 degrees in the day, with those requiring 45 degrees night and 60 degrees in the day, such as lettuce, radishes, parsley, onion and most vegetable plants.

When the days begin to lengthen, a radical change takes place in growing conditions. After January 15 much brighter weather prevails and it is possible to raise a combination of low temperature crops with cucumbers, tomatoes, and New Zealand Spinach, with fairly satisfactory results. However, it is better to defer planitng these combinations until the last of February.

Lettuce, radishes, onions, parsley, celery, and vegetable plants can be grown together quite successfully. Onions and parsley may be planted in partially shaded and cool places in the house and still give good results. Lettuce and radishes must have full light and sunshine and a uniform temperature to develop perfectly.

Vegetable plants to become strong and sturdy must also have full light and sunshine and developed with moderate heat. Eggplant and peppers are an exception requiring considerable heat. Plants may be grown in a relatively high temperature if it is done with a minimum amount of moisture but requires constant care and attention and is not to be recommended.

The fall crop of tomatoes should not be planted later than August 1st. After this date it is hard to get a satisfactory development of fruit. It has been found that fruit grown before dull cloudy weather comes, is of fine quality and will ripen up in fine shape no matter what weather conditions are later on, while those set later are small and of inferior quality.

Seed for this crop should be sown in June in a cool, well ventilated greenhouse. The growth of the plants are best controlled in bunches with five or six inches of soil. They should be grown slowly by giving as little moisture as possible. It is not necessary to pot the plants for this crop. By frequent transplanting and giving plenty of room, strong healthy plants can be had by August 1st which will establish themselves readily in ground that has been previously thoroughly moistened.

They are usually planted in rows three feet apart and sixteen inches in the rows. Heavy, coarse, manure mulch may be applied before planting and will serve very beneficially.

Fall cucumbers may be started and planted in the same manner as tomatoes but should be started about four or five weeks later and plants are better if potted.

New Zealand Spinach may be sown in June or July, put into 2½ inch pots when of right size and planted in permanent beds in August in rows 24 inches apart and 16 inches apart in the rows. Soil should be highly fertilized. This spinach of all plants will stand more neglect with reference to ventilation, heat and lack of water than anything under cultivation. When the plants begin to spread care must be taken not to apply water directly on them which will cause serious loss from decay. The main or center stem should be carefully protected and not cut, otherwise it will lose its symmetrical habit of growth and will develop a superabundance of laterals.

New Zealand Spinach promises to become a valuable addition to greenhouse crops. It will take some effort to establish a demand for it until its good qualities become known. It has wonderful keeping qualities, remaining fresh for days without decaying, is always clean and attractive and very tender, especially when greenhouse grown. The dealer likes it because of its splendid keeping qualities and the housewife because so very clean and free from grit.

Parsley is probably the easiest crop to grow and will succeed where conditions are such that other crops give only partial results. Old plants from the field may be used but from seed sown in June or July, potted into 2½ inch pots and set in permanent beds in August give much better results. The crop from new plants can be used earlier and will last much longer before going to seed.

The spring crop of tomatoes is planted from January to April being intercropped with lettuce or radishes. They are spaced the same as for fall crop. Care should be taken not to crowd them too much with lettuce or radishes, especially if the tomato plants are large when first set. The same treatment may be given the spring cucumber except that it is best to plant a month later than tomatoes, unless plenty of heat, can be given earlier.

Seeds for the spring crop of tomatoes should be sown November and December in 60 degrees or more of heat. Should there be a warm place near heating pipes with full light and sunshine and large enough to accommodate plant boxes, a good start may be made this way after which they may be transplanted into a hotbed made in some convenient place in the house. When large enough they can be put into pots and plunged into the hotbed. Frequent shifting will need to be done giving more room at each shift. Cucumbers may be treated in the same manner and will develop into strong, vigorous plants, although more heat is required to start them.

For spring cucumbers it is good plan to apply about 1 bushel wood ashes to 300 square feet ground after the lettuce

and radishes have been removed. Also a heavy, coarse manure which is beneficial at this time.

Vegetable plants can also be grown in an occupied place but must be given almost constant daily attention.

The question confronting the greenhouse grower is what are the most profitable crops to grow. This undoubtedly depends largely on local conditions. In Western Pennsylvania thousands of tons of cucumbers, tomatoes, and lettuce are grown and with some of the larger establishments are an exclusive crop.

It is usually those with limited areas and selling locally that depend on a combination such as mentioned and this is no doubt an advantage, avoiding the possibility of being required to ship a small surplus periodically. There is, however, an advantage in growing single crops if the market will warrant it.

COUNTY HORTICULTURAL SOCIETIES

At the 1921 meeting of the State Horticultural Association an amendment to Article 2 of the By-Laws was adopted as follows:

"Members of County, District or Local Horticultural Societies shall be granted membership in the State Horticultural Association as follows:

1. The County, Local or District Horticultural Societies shall have at least fifteen paid up members and shall hold at least one meeting a year.

2. The Secretary of the County, Local or District Society shall remit to the Secretary of the State Association annually one dollar for each member before January 31 of each year, which shall be their dues in the State Association for the year.

3. The Secretary of the County, Local or District Society shall transmit to the Secretary of the State Association annually a list of its officers and members, together with a brief report of its work, particularly of those matters that are of general interest to the horticulturists of the state. The State Horticultural Association shall publish these reports in its Proceedings, which shall be distributed to the membership of the county of local societies that have complied with these provisions."

This plan of affiliation has not as yet been presented to all the county societies, but three have already adopted it and others will do so within the year. Eventually we hope all the county societies may be included. It is the policy of the State Association to foster the organization of new county horticultural societies on this basis, and the officers of the association will be glad to assist in this work.

COUNTY HORTICULTURAL SOCIETIES AFFILIATED WITH THE STATE HORTICULTURAL ASSOCIATION

ADAMS COUNTY FRUIT GROWERS ASSOCIATION

This Association, which has had many years of very successful service, fell into a decline during the war. It was reorganized on March 10, 1922 in affiliation with the State Association.

PRESIDENT

C. A. Griest, Guernsey.

VICE PRESIDENTS

W. E. Grove, York Springs. H. M. Keller, Gettysburg—5.
Frederick E. Griest, Flora Dale. C. A. Wolfe, Gardners.

SECRETARY

Edwin C. Tyson, Flora Dale.

TREASURER

Wm. S. Adams, Gardners.

EXECUTIVE BOARD

C. A. Griest, Guernsey. W. E. Grove, York Springs.
H. M. Keller, Gettysburg, No. 5. Frederick E. Griest. Flora Dale.
C. A. Wolfe, Gardners. Edwin C. Tyson, Flora Dale.
Wm. S. Adams, Gardners.

Legislative Committee

F. E. Griest, Chairman, Flora Dale.
R. M. Eldon, Aspers. C. J. Tyson, Flora Dale.

Exhibit Committee

C. A. Wolfe, Chairman, Gardners.
C. E. Raffensperger, Arendtsville. S. C. Keller, Gettysburg No. 5.
B. F. Wilson, Aspers.

Program Committee

W. E. Grove, Chairman, York Springs.
W. W. Boyer, Biglerville. E. F. Strasbaugh, Orrtanna.

Membership Committee

H. M. Keller, Chairman, Gettysburg, No. 5.
E. C. Kiefer, York Springs. G. C. Strong, Orrtanna.
C. W. Peters, Biglerville. J. A. Kane, Biglerville.
E. N. Hoffman, Biglerville. H. E. Riddlemoser, McKnightstown.

MEMBERSHIP ROLL

Adams, Wm. S. ..... Gardners, Pa.
Asper, D. C. ..... Aspers, Pa.
Bream, Samuel ..... Biglerville, Pa.
Boyer, W. W. ..... Arendtville, Pa.
Baugher, H. G. ..... Aspers, Pa.
Baugher, Ira ..... Aspers, Pa.
Bittinger, C. H. ..... R. D. 6., Hanover, Pa.
Benner, B. E. ..... Virginia Mills, Pa.
Boyer, George E. ..... Arendtsville, Pa.
Bushman, S. F. ..... Gettysburg, Pa.
Bream, H. J. ..... Aspers, Pa.
Blessing, David H. ..... Harrisburg, Pa.
Bream, W. A. ..... Gettysburg, Pa.

Brinton, H. C. ..... Hanover, Pa.
Baltzley, C. S. ..... Orrtanna, Pa.
Baltzley, S. Luther ..... Orrtanna, Pa.
Butt, J. L. ..... Gettysburg, Pa.
Carey, J. Calvin ..... Gettysburg, Pa.
Crouse, E. A. ..... Gettysburg, Pa.
Cation, W. R. ..... Orrtanna, Pa.
Cole, James C. ..... Biglerville, Pa.
Deardorf, Anthony ..... Gettysburg, Pa.
Dock, Miss Margaret ..... Fayetteville, Pa.
Dock, Miss Mira L. ..... Fayetteville, Pa.
Davis, Wm. ..... York Springs, Pa.
Dougherty, Dorsey ..... Gettysburg, Pa.
Deatrick, H. G. ..... Hunterstown, Pa.
Diller, O. ..... York Springs, Pa.
Dill, Dr. M. T. ..... Biglerville, Pa.
Deardorff, Charles ..... Orrtanna, Pa.
Dull, Thomas D. ..... Aspers, Pa.
Eldon, Robert M. ..... Aspers, Pa.
Eiholtz, S. Mc. ..... Biglerville, Pa.
Enck, W. K. ..... Biglerville, Pa.
Eppleman, H. C. ..... Aspers, Pa.
Eshelman, S. C. ..... Gettysburg—5, Pa.
Fraim, Merritt L. ..... Aspers, Pa.
Fohl, Goerge G. ..... Biglerville, Pa.
Fiddler, W. B. ..... Aspers, Pa.
Griest, C. Arthur ..... Guernsey, Pa.
Griest, A. W. ..... Flora Dale, Pa.
Griest, Frederic E. ..... Flora Dale, Pa.
Griest, Maurice ..... 105 W. 163rd St., New York City
Garretson, Frank ..... Aspers, Pa.
Garretson, Eli P. ..... Biglerville, Pa.
Garretson, Robert ..... Flora Dale, Pa.
Garretson, Eli ..... R. D. 5., Gettysburg, Pa.
Garretson, John ..... Aspers, Pa.
Gardner, L. M., Jr. ..... York Springs, Pa.
Grove, W. E. ..... York Springs, Pa.
Groupe, Foster C. ..... Gardners, Pa.
Howard, Jno. M. ..... Aspers, Pa.
Hoffman, James O. ..... Arendtville, Pa.
Hoffman, Robert ..... Arendtville, Pa.
Hoffman, E. N. ..... Biglerville, Pa.
Hoffman, D. M. ..... Biglerville, Pa.
Hoffman, George ..... Arendtsville, Pa.
Huber, Charles H. ..... Gettysburg, Pa.
Hartman, George R. ..... Biglerville, Pa.
Hummel, P. T. ..... Harrisburg, Pa.
Hershey, C. A. ..... McKnightstown, Pa.
Hartzel, B. L. ..... Flora Dale, Pa.
Jacobs, Daniel C. ..... Gettysburg, No. 5, Pa.
Keller, H. M. ..... Gettysburg, No. 5, Pa.
Klinefelter, U. S. ..... Biglerville, Pa.
Kane, J. A. ..... Biglerville, Pa.
Kane, J. Lewis ..... Gettysburg, No. 5, Pa.
Knouse, J. A. ..... Arendtsville, Pa.
Kunkle, Jno. R. ..... Gettysburg, Pa.
Koser, Rev. D. T. ..... Arendtsville, Pa.
Koser, G. W. ..... Biglerville, Pa.
Keller, S. C. ..... Gettysburg, No. 5, Pa.
Keller, Paul ..... Gettysburg, No. 5, Pa.

Knab, Mrs. George N. ..... New Oxford, Pa.
Longsdorf, C. L. ..... Biglerville, Pa.
Lawver, Rufus W. ..... Biglerville, Pa.
Lupp, Reuben ..... Biglerville, Pa.
Large, Mrs. E. S. ..... Orrtanna, Pa.
Lippy, J. D. ..... Gettysburg, Pa.
Lewis, Harvey D. ..... Orrtanna, Pa.
Lucabaugh, J. W. ..... Hanover, 6, Pa.
Myers, George P. ..... Biglerville, Pa.
Minter, Thomas L. ..... Biglerville, Pa.
Musselman, C. H. ..... Biglerville, Pa.
Miller, E. M. ..... Hanover, Pa.
Moyer, Dr. H. B. ..... Gettysburg, Pa.
Myers, R. E. ..... York Springs, Pa.
Marsh, G. T. ..... Walbrook Apartments, Baltimore, Md.
Minick, W. L. ..... Waynesboro, Pa.
Musselman, Jno. ..... Orrtanna, Pa.
Oakwood Corporation ..... York Springs, Pa.
Oyler, George ..... Gettysburg, Pa.
Oyler, George C. ..... Gettysburg, Pa.
Orner, P. S. ..... Arendtsville, Pa.
Orrtanna Canning Co. ..... Orrtanna, Pa.
Orner, Harry ..... Aspers, Pa.
Orner, I. S. ..... Arendtsville, Pa.
Prickett, Josiah W. ..... Biglerville, Pa.
Peters, W. V. ..... Guernsey, Pa.
Peters, Curtis W. ..... Biglerville, Pa.
Pitzer, Harry C. ..... Aspers, Pa.
Peters, George M. ..... Aspers, Pa.
Pitzer, Willis ..... Arendtsville, Pa.
Peters, Jno. B. ..... York Springs, Pa.
Peters, Mrs. J. H. ..... Bendersville, Pa.
Pepple, Samantha ..... Orrtanna, Pa.
Raffensperger, Charles E. ..... Arendtsville, Pa.
Raffensperger, Roy ..... Arendtsville, Pa.
Raffensperger, Harvey E. ..... Arendtsville, Pa.
Rice, E. E. ..... Aspers, Pa.
Rice, O. C. ..... Biglerville, Pa.
Rice, C. S. ..... Arendtsville, Pa.
Rice, A. E. ..... Biglerville, Pa.
Rhodes, T. F. ..... Aspers, Pa.
Roberts, Arthur ..... Gettysburg, Pa.
Riddlemoser, H. E. ..... McKnightstown, Pa.
Rex, Raymond ..... Gardners, Pa.
Shorb, Albert ..... Hanover, Pa.
Stover, Dr. J. G. ..... Bendersville, Pa.
Strong, George C. ..... Orrtanna, Pa.
Slaybaugh, Elmer ..... Aspers, Pa.
Smith, G. Frank ..... Aspers, Pa.
Shull, Robert H. ..... McKnightstown, Pa.
Spangler, George E. ..... Gettysburg, Pa.
Snyder, E. Bane ..... Jack's Mountain, Pa.
Starner, A. E. ..... Aspers, Pa.
Sachs, Edw. S ..... Biglerville, Pa.
Stock, E. C. ..... 3610 Clifton Ave., Baltimore, Md.
Strasbaugh, E. F. ..... Orrtanna, Pa.
Sheely, A. D. ..... Arendtsville, Pa.
Stahle, C. E. ..... Gettysburg, Pa.
Starry, W. D. ..... York Springs, Pa.
Tyson, Edwin C. ..... Flora Dale, Pa.

Tyson, Chester J. ..... Flora Dale, Pa.
Tyson, Wm. C. ..... Guernsey, Pa.
Taylor, Jacob F. ..... Arendtsville, Pa.
Taylor, Daniel R. ..... Biglerville, Pa.
Taylor, Henry ..... Biglerville, Pa.
Trostle, Francis ..... R. F. D., York Springs, Pa.
Thomas, Mrs. Annie M. ..... Gettysburg, Pa.
Topper, Z. F. ..... Emmittsburg, Md.
Thompson, G. R. ..... Gettysburg, Pa.
Taylor, A. M. ..... Biglerville, Pa.
Vance, Charles T. ..... Orrtanna, Pa.
Weidner, A. I. ..... Arendtsville, Pa.
Wolfe, C. A. ..... Aspers, Pa.
Wolfe, Harry E. ..... Aspers, Pa.
Wolff, Dr. W. E. ..... Arendtsville, Pa.
Wolf, Charles M. ..... York Springs, Pa.
Wilson, B. F. ..... Biglerville, Pa.
Weaner, Charles C. ..... Bendersville, Pa.
Weaner, W. C. ..... Aspers, Pa.
Wible, R. E. ..... Gettysburg, Pa.
Wright, Ryland ..... Aspers, Pa.
Weaver, D. I. ..... Gettysburg, Pa.
Williams, J. L. ..... Gettysburg, Pa.
Williams, M. I. ..... Gettysburg, Pa.
Walter, Martin T. ..... Biglerville, Pa.
Walter, J. C. ..... Biglerville, Pa.

FRANKLIN COUNTY FRUIT GROWERS ASSOCIATION

PRESIDENT

W. C. Bingham, St. Thomas.

VICE PRESIDENTS

Charles W. Reichard, Waynesboro.

TREASURER

D. Edward Long, Chambersburg.

SECRETARY

Willis A. Hess, R. D. 1., Mont Alto.

ASST. SECRETARY

R. J. Gillan, St. Thomas.

Executive Committee

W. C. Bingham, St. Thomas. Willis A. Hess, R. D. 1., Mont Alto.
J. H. Karns, Chambersburg. J. E. Reasner, Shippensburg.
J. B. Crawford, Fayetteville.

Alexander, W. M., & Son ..... Dry Run, Pa.
Amberton, P. M. ..... Waynesboro, Pa.
Barkdoll, A. E. ..... R. D. 3., Smithsburg, Md.
Benedict, H. M. ..... R. D. 1., Waynesboro, Pa.
Bingham, A. H. ..... St. Thomas, Pa.
Bingham, W. O. ..... St. Thomas, Pa.
Bikle, Philip ..... R. D. 11., Chambersburg, Pa.
Bream, D. M. ..... Chambersburg, Pa.
Brereton, O'Hara D. ..... Edenville, Pa.
Burgner, M. K. ..... Chambersburg, Pa.
Burgner, S. A. ..... Chambersburg, Pa.
Crawford, J. B. ..... Fayetteville, Pa.
Crawford, T. H. ..... Fayetteville, Pa.
Criswell, R. T. ..... Chambersburg, Pa.

Diehl, Edgar B. .....St. Thomas, Pa.
Diffenderfer, C. R. .....Edenville, Pa.
Gehr, Harvey J. .....R. D. 1., Waynesboro, Pa.
Gelwicks, Dr. John M. .....Chambersburg, Pa.
Gillan, C. F. .....St. Thomas, Pa.
Gillan, G. G. .....St. Thomas, Pa.
Gillan, R. J. .....St. Thomas, Pa.
Heisey, S. A., & Brother .....R. D. 4., Greencastle, Pa.
Hess, Daniel .....Waynesboro, Pa.
Hess, Paul G. .....R. D. 1., Mont Alto, Pa.
Hess, Ralph C. .....Waynesboro, Pa.
Hess, Ray B. .....R. D. 1., Mont Alto, Pa.
Hess, S. S. .....Waynesboro, Pa.
Hess, Willis A. .....R. D. 1., Mont Alto, Pa.
Horn, W. H. .....R. D. 10 Chambersburg, Pa.
Karns, J. H. .....Chambersburg, Pa.
Landis, D. L., Jr .....R. D. 1., Chambersburg, Pa.
Latshaw, J. E. .....Marion, Pa.
Long, D. Edward .....Chambersburg, Pa.
Long, W. G. .....Fayetteville, Pa.
McLaughlin, S. C. .....Fort Louden, Pa.
Miller, Clayton .....Marion, Pa.
Miller, D. L. .....Waynesboro, Pa.
Minick, W. L. .....Waynesboro, Pa.
Minehart, T. Z. .....Chambersburg, Pa.
Mish and Croft .....St. Thomas, Pa.
Nelson, D. H. .....Chambersburg, Pa.
Newcomer, J. W. .....R. D. 1., Waynesboro, Pa.
Nicodemus, Edwin .....Zullinger, Pa.
Omwake Brothers .....Greencastle, Pa.
Phiel, Clifford .....St. Thomas, Pa.
Pomeroy, Ralph S. .....Chambersburg, Pa.
Rahauser Brothers .....Greencastle, Pa.
Reasner, J. E. .....Shippensburg, Pa.
Reed, Fred B. .....Chambersburg, Pa.
Reichard, Charles W. .....Waynesboro, Pa.
Renfrew, R. M. .....Fayetteville, Pa.
Sharpe, Walter K. .....Chambersburg, Pa.
Shetron, W. F. .....R. D. 6., Chambersburg, Pa.
Shields, Ira M. .....R. D. 5., Chambersburg, Pa.
Shockey, Luther P. .....R. D. 9., Chambersburg, Pa.
Skinner, H. W. .....Chambersburg, Pa.
Smith, G. Walter .....R. D. 1., Smithsburg, Md.
Smith, J. Arthur .....R. D. 10., Chambersburg, Pa.
Smith, J. H. .....Chambersburg, Pa.
Snowberger, A. I. .....R. D. 1., Waynesboro, Pa.
Stevenson Brothers .....Midvale, Pa.
Tolbert, Henry .....R. D. 11., Chambersburg, Pa.
Weaver, Edward A. .....Fayetteville, Pa.
Wertz, D. Maurice .....Waynesboro, Pa.
Wingert, J. K. .....Chambersburg, Pa.
Wishard, W. H. .....R. D. 9., Chambersburg, Pa.
Witherspoon, D. Erskine .....R. D. 9., Chambersburg, Pa
Zullinger, T. A. .....Chambersburg, Pa.
McIlvaine, J. S. .....R. D. 1., Fayetteville, Pa.

SECRETARY'S REPORT

December 16, 1921 County Agent Knode called a meeting of all fruit growers of Franklin County to give them an

opportunity to state and discuss their troubles. At this meeting Hodgkiss, Nixon, and Vinson were present, representing State College, and offering their services and made interesting addresses at the meeting. The growers recited difficulties with collar blight, root rot, wooly aphids, green aphids, red bug, scab, codling moth, San Jose Scale and various such things all of which were noted for future consideration. The State College representatives then volunteered to establish educational demonstrations throughout the county for the benefit of the growers, located where most practical, to enlighten them in means and methods of control of orchard pests, trimming practices, fertilizer and cultural methods, etc. A committee was appointed at this meeting to confer with the State College authorities to perfect a plan of procedure. This conference was held and plans are now almost finished for the program of work along demonstrational and educational lines by extension representatives from State College.

At the December 16th meeting the growers who spoke, repeatedly deplored the fact that we were without a horticultural organization in Franklin County, the leading or at most second to leading fruit growing county in the state. It was then discovered that an organization did exist but that it had been in a pupal state to put it mildly, though stone dead would no doubt more nearly express it, for fifteen years. A very strong sentiment seemed to prevail at the meeting to reorganize and it was suggested that the officers of the old organization call a meeting soon as convenient to reorganize. January 11th was selected and the meeting advertised, but a furious blizzard prevented it being held. Another was called for January 21st with about twenty growers present, bad weather again preventing a larger attendance. At this meeting new officers were elected and all indications of the start of an important, progressive, helpful organization seemed evident. Everyone seemed to realize the need of being organized and showed enthusiastic willingness to push it.

Our second meeting was held February 4th with about 75 growers present. It was a very representative audience, coming from all sections of the county and representing the larger and the smaller plantings. The feature that contributed so largely to the success of this meeting was the presence of Dr. Fletcher from State College, newly elected president of the State Horticultural Association of Pennsylvania. Dr. Fletcher explained the plan whereby county organizations may become affiliated with the state association, the individual members of the county society thereby becoming members of the state association. After hearing Dr. Fletcher, it was unanimously voted that we join in with the state association on their plan. Dr. Fletcher then favored the audience with an interesting general talk on horticultural matters, the relative

importance of this section as a fruit producer, its future prospects and especially the importance of being well organized to insure the greatest success in our business. His remarks were such, coming at this particular time at the start of our organization, that our movement was decidedly benefited and helped at this critical period of its life. General discussions of some of the principal needs of the growers were then discussed. The matter of a more uniform pack for the county, developing toward a standard grade to be marketed in some kind of co-operative way was discussed and it was agreed that we develop as seems best in this direction. Ways and means of securing a better outlet for our by-product grade of apples was considered. It was decided to first make a careful survey of the planting and estimated production of the county to place before the proper parties to induce them to establish canneries, evaporators, presses, etc., at convenient points in sections where a sufficient amount of such fruit is produced. It was decided to send out a questionaire to all growers of the county to secure data from which this information will be compiled. Over 200 of these are being sent out. Next meeting will be held n Greencastle, March 4th.

A committee from our society is now working in co-operation with the Agricultural Committee of the Chambersburg Chamber of Commerce for the definite purpose of trying to have a satisfactory apple by-product plant located at or near Chambersburg.

The Waynesboro Chamber of Commerce in co-operation with some members of our society have called a meeting to be held in Waynesboro March 11th to discuss the practicability of establishing a community packing house in the Waynesboro district. It is proposed to have a number of persons who are familiar with the workings of such plants at the meeting to help guide them in making a decision of what to do.

Might say that in both Chambersburg and Waynesboro they have very active Chambers of Commerce. They are willing and eager to co-operate with us and give us any assistance that is in their power to give.

Willis A. Hess, Secretary

LANCASTER COUNTY FRUIT AND VEGETABLE GROWERS' ASSOCIATION

PRESIDENT

Benjamin S. Huber, Elizabethtown.

VICE PRESIDENTS

L. B. Huber, R. D. 5., Lancaster.
A. L. Kauffman, Ronks.
E. S. Hacker, Ephrata.
Roy N. Peris, Florin.

SECRETARY

T. Warren Metzger, Lancaster County Farm Bureau

TREASURER

S. E. Forry, Ephrata.

Brossman, Morse W. ..... R. D. 4., Ephrata, Pa.
Borry, E. E. ..... R. D. 2., Stevens, Pa.
Bolton, W. P., & Son ..... Holtwood, Pa.
Borry, Moses ..... R. D. 2., Stevens, Pa.
Enders, J. F. ..... R. D. 2., Columbia, Pa.
Funk, Blair ..... R. D. 1., Pequea, Pa.
Felty, G. B. O. ..... Millersville, Pa.
Forry, S. E. ..... R. D. 1., Ephrata, Pa.
Gise, Willis H. ..... R. D. 5., Lancaster, Pa.
Good, Martin R. ..... Blue Ball, Pa.
Good, S. H., & Son ..... R. D. 7., Lancaster, Pa.
Hershey, E. Maurice ..... R. D. 1., Gordonville, Pa.
Hostetter, J. E. ..... Gap, Pa.
Herr, David S. ..... R. D. 7., Lancaster, Pa.
Hess, Francis P. ..... R. D. 7., Lancaster, Pa.
Herr, C. H. ..... R. D. 2., Lancaster, Pa.
Harnish, C. H. ..... Leola, Pa.
Longenecker, J. E. ..... Mt. Joy, Pa.
Longenecker, Harry ..... R. D. 1., Ephrata, Pa.
Lepole, Walter L. ..... Akron, Pa.
Mohler, David G. ..... Ephrata, Pa.
Nolt, Harrison S. ..... R. D. 1., Columbia, Pa.
Reist, Henry G. ..... 110 Avon Road, Schenectady, N. Y.
Root, J. W. ..... R. D. 1., Manheim, Pa.
Snyder, C. B. ..... R. D. 1., Ephrata, Pa.
Shank, John H. ..... R. D. 7., Lancaster, Pa.
Staffer, Aaron O. ..... R. D. 3., Ephrata, Pa.
Vogel, Elias H. ..... R. D. 3., Lancaster, Pa.
Witmer, John B. ..... Lampeter, Pa.
Weaver, Elmer J. ..... Ronks, Pa.
Wenger, M. P. ..... Denver, Pa.
Warfel, John H. ..... Roherestown, Pa.
Wenger, G. P. ..... R. D. 1., Quarrysville, Pa.
Burkhart, John ..... R. D. 4., Ephrata, Pa.
Weaver, M. M. ..... Mountville, Pa.
Ditzler, Jacob W. ..... R. D. 1., Lititz, Pa.
Furlow, Eber ..... Hopeland, Pa.
Bollinger, Jacob M. ..... R. D. 1., Lititz, Pa.
Wertsch, Edwin ..... R. D. 5., Lititz, Pa.
Hainley, J. N. ..... R. D. 2., Ephrata, Pa.

CHESTER—DELAWARE FRUIT GROWERS' ASSOCIATION

This Society voted in 1921, to affiliate with the State Association, but is now being reorganized, and the affiliation has not been consummated. The officers for 1922 are:

PRESIDENT

Guy L. Hayman, West Chester.

SECRETARY

Herbert C. Barker, West Chester.

TREASURER

Russell H. Worthington, West Chester.

COUNTY HORTICULTURAL SOCIETIES NOT YET AFFILIATED WITH THE STATE HORTICULTURAL ASSOCIATION

ALLEGHENY COUNTY FRUIT AND VEGETABLE GROWERS' ASSOCIATION

PRESIDENT

M. C. Black, Allison Park.

VICE PRESIDENT

R. K. McEwen, R. D. 1., Bridgeville.

SECRETARY

L. J. Letterle, R. D., Glenshaw.

TREASURER

W. H. Hockburg, R. D. 1., Verona.

LAWRENCE COUNTY FRUIT GROWERS' ASSOCIATION

S. R. Huey, President .....New Castle, R. D. 3

Rankin Johnson, Secretary and Treasurer ..New Wilmington

Last summer at the beginning of the apple season, the Association held meetings every week at the orchards of the different members of the Association. They sent a representative to the Annual Meeting of the Commission Merchants and Fruit Growers at Cincinnati last summer.

Mr. J. A. Boak, New Castle, R. D. 6 was the delegate and handed out cards advertising the Lawrence County Association. As a result of this, a great many inquiries were had for apples and a very ready sale was therefore obtained. There were about 100,000 thousand bushels of apples grown in this county last spring.

This spring the Association has ordered spray material, fertilizer and fruit trees for its members.

—N. C. Dale, County Agent.

LEBANON COUNTY FRUIT AND VEGETABLE GROWERS' ASSOCIATION

PRESIDENT

J. M. Horst, R. D. 3., Lebanon.

VICE PRESIDENT

Irvin Longenecker, Palmyra.

SECRETARY—TREASURER

P. R. Boltz, R. D. 3., Lebanon.

OTHER MEMBERS

Meyer, E. J. .....R. D. 3., Lebanon, Pa.
Heffelfinger, Gotlieb .....R. D. 3., Myerstown, Pa.
Miller, A. D. .....R. D. 3., Lebanon, Pa.
Bucher, Alvin .....R. D. 4., Meyerstown, Pa.
Reist, Wm. S. .....R. D. 7., Lebanon, Pa.
Wilhelm, Daniel .....R. D. 1., Palmyra, Pa.
Hartman, Jos. .....R. D. 4., Lebanon, Pa.
Reist, A. E. .....R. D. 2., Palmyra, Pa.
Snavely, The Misses .....R. D. 8., Lebanon, Pa.
Heilman, Albert .....Cleona, Pa.
Bomberger, Howard .....R. D. 7., Lebanon, Pa.
Horst, Harry .....R. D. 4., Lebanon, Pa.
Hartman, Aaron .....R. D. 8., Lebanon, Pa.
Ensminger, Sam. .....R. D. 4 , Lebanon, Pa.
Krall, Wm. O. .....R. D. 4., Myerstown, Pa.
Longenecker, Isaac .....Palmyra, Pa.
Royer, Wm. .....R. D. 4., Myerstown, Pa.
Bicksler, John H. .....R. D. 1., Jonestown, Pa.
Trump, Charles .....R. D. 5., Lebanon, Pa.
Rabel, Amos C. .....R. D. 5., Lebanon, Pa.
Snavely, H. Meyer .....R. D. 8., Lebanon, Pa.
Ulrich, Wm. L. .....Annville, Pa.
Keller, Henry .....R. D. 4., Lebanon, Pa
Meck, John W. .....Jonestown, Pa.
Snavely, M. H. .....R. D. 8., Lebanon, Pa.
Wolff, Paul .....Myerstown, Pa.
Meyer, D. H. .....Annville, Pa.
Glick, Sam. .....R. D. 1., Lebanon, Pa.
Rank, Wm. .....R. D. 8., Lebanon, Pa.
Miller, Alfred .....R. D. 8 , Lebanon, Pa.
Bean, Wm. J. .....R. D. 3., Lebanon, Pa.
Stoudt, D. M. .....R. D. 1., Hershey, Pa.
Behney, Amos .....R. D. 3., Myerstown, Pa.
Behney, Edwin .....R. D. 1., Fredericksburg, Pa.
Emerich, R. J. .....R. D. 2., Annville, Pa.

ACTIVITIES

The organization's activities were chiefly along the lines of buying spraying material and packages co-operatively. Lime-Sulphur, Black Leaf 40, Lead Arsenate, Bluestone, Peach Baskets and Berry Boxes comprised the list of materials that were bought. The total purchases amounted to $2,400.

The Association held five meetings during the year at each of which part of the program was devoted to discussing some phase of the fruit growing business. Several of these meetings were attended by speakers from outside the county who spoke on spraying.

The peach growers in the Association agreed last summer to charge 10 cents apiece for baskets—money to be refunded to the buyers upon return of the baskets in good condition. This was done for the sake of economy and turned out to be satisfactory, as most of the peaches were sold locally.

The peach growers also started this fall in trying out paradichlorobenzene to control the borer. The material was bought co-operatively and a demonstration on applying it was held in one of the orchards. Approximately 4,000 trees were treated and a later inspection indicated success.

—A. C. Berger, County Agent.

PERRY COUNTY HORTICULTURAL SOCIETY

Reorganized March 17, 1922

PRESIDENT
Daniel Rice, New Bloomfield.

SECRETARY
M. R. Bower, R. D. 1., Landisburg.

TREASURER
Wm. S. Clegg, New Bloomfield.

Wm. G. Loy ..... Newport, Pa.
Howard Jones ..... Newport, Pa.
Sharon, S. A. ..... Newport, Pa.
Kane, D. R. ..... Elliotsburg, Pa.
Stewart, Wm. ..... Landisburg, Pa.
Adair, Frank ..... R. D. 1., Landisburg, Pa.
Nickle, C. C. ..... Loysville, Pa.
Schuchman, G. W. ..... Shermansdale, Pa.
Stewart, George W. ..... R. D. 1., New Bloomfield, Pa.
Clouser, Warren ..... New Bloomfield, Pa.
Utley, John ..... R. D. 1., Elliotsburg, Pa.
Shearer, Vernon ..... R. D. 1., New Bloomfield, Pa.
Kitner, Joshua ..... R. D. 1., New Bloomfield, Pa.

YORK COUNTY FRUIT GROWERS' ASSOCIATION

PRESIDENT
C. P. Kibbler, York.

VICE PRESIDENTS
L. E. Hartman, Cly. C. M. Wernig, York.

SECRETARY
J. Bentz Kauffman, R. D. 7., York.

TREASURER
Howard Anderson, Stewartstown.

During the past six months the York County Association has incorporated in order to be able to secure fertilizers, barrels, spray materials, etc., to better advantage for its members. Several meetings have been held during the year at irregular intervals and an annual meeting in December.

About sixty members took part in an auto tour with the Lancaster County Association last summer and it was hoped that quite a number will attend the joint meeting of the Adams and Franklin counties association at Gettysburg on March 10.

—W. F. Mandeville, Asst. County Agent.

There are several other County Horticultural Societies that are more or less active including Wyoming, Lackawanna and Cambria counties, but the Secretary has been unable to secure definite information about them. Let us have a full roster in the next Proceedings.

U. S. CENSUS, 1920

APPLES IN PENNSYLVANIA: Number of trees, 1920, and production, 1919, by counties.

County	Trees of bearing age	Rank in number of bearing trees	Bushels harvested	Trees not of bearing age
Adams	254,228	2	742,196	280,355
Allegheny	151,246	14	69,998	57,079
Armstrong	118,664	25	40,161	28,035
Beaver	102.095	31	67,670	54,679
Bedford	279,283	1	152,314	59,893
Berks	181.309	6	254,453	96,869
Blair	114,110	27	37,230	28,528
Bradford,	136,858	16	68,675	34.198
Bucks,	120,980	24	152,404	65,844
Butler	165.238	9	30,871	44,015
Cambria	99,536	35	11,192	25,682
Cameron	6,712	66	1,289	2.703
Carbon	42,178	56	42.047	21,067
Centre	77,954	46	47,724	22,397
Chester	122.331	23	148,574	67,421
Clarion	88,699	41	5,611	25,627

Clearfield	118,394	26	15,338	18,869
Clinton	37,322	58	13,898	8,100
Columbia	96,624	38	83,327	37,882
Crawford	198,025	5	56,795	19,434
Cumberland	106,791	30	167,083	77,271
Dauphin	91,799	40	61,689	48,501
Delaware	23,854	62	32,527	17,814
Elk	26,344	61	5,486	4,502
Erie	171,757	8	119,838	46,679
Fayette	100,896	34	32,991	20,336
Forest	15,576	65	771	2,639
Franklin	239,011	3	468,205	101,424
Fulton	92,080	39	83,799	15,026
Greene	134,288	17	49,921	27,552
Huntingdon	88,687	42	53,841	35,998
Indiana	130,910	18	36,037	34,098
Jefferson	113,934	28	10,006	25,104
Juniata	42,884	55	62,515	12,094
Lackawanna	101,420	32	38,611	39,356
Lancaster	124,431	21	169,244	98,191
Lawrence	74,743	47	38,470	32,590
Lebanon	54,695	52	67,257	26,892
Lehigh	67,400	49	120,867	39,722
Luzerne	165,133	10	121,316	90,829
Lycoming	111,289	29	76,267	33,397
McKean	49,101	54	22,601	6,708
Mercer	141,841	15	73,402	29,714
Mifflin	30,305	60	43,805	13,344
Monroe	59,175	51	48,304	19,301
Montgomery	98,365	37	90,640	65,187
Montour	19,727	64	8,405	12,099
Northampton	64,178	50	81,706	25,586
Northumberland	101.106	33	70,785	36,208
Perry	68,046	48	88,433	34,612
Philadelphia	2,369	67	4,940	1,932
Pike	23 831	63	18 569	4,529
Potter	83,131	44	52,666	7,163
Schuylkill	125,828	20	123,443	54,903
Snyder	51,742	53	84,488	29,920
Somerset	159,041	11	17,566	39,542
Sullivan	33,998	59	24,391	14,049
Susquehanna	158,674	12	42,904	26,702
Tioga	122,762	22	103,471	10,161
Union	37,817	57	39,914	10,725
Venango	88,499	43	6,113	13,531
Warren	99,271	36	10,118	3.954
Washington	129,212	19	77,579	46,970
Wayne	178,596	7	77,598	35,336
Westmoreland	157,295	13	65,456	51,638
Wyoming	80,450	45	66,179	63,609
York	234,526	4	310,811	141,938

PEACHES IN PENNSYLVANIA: Number of trees, 1920, and production, 1919, by counties.

County	Trees of bearing age	Rank in number of bearing trees	Bushels harvested	Trees not of bearing age
Adams	141,278	5	86,563	52,829
Allegheny	170,278	1	43,584	46,573
Armstrong	63,266	21	6,931	28,085
Beaver	165,234	2	36,131	57,884
Bedford	36,134	40	1,245	19,377
Berks	111,503	8	79,471	71,502
Blair	54,379	29	5,519	15,830
Bradford	51,542	33	7,890	13,074
Bucks	142,936	4	70,779	45,201
Butler	80,986	16	5,317	29,508
Cambria	24,901	47	596	12.035
Cameron	235	65	5	42
Carbon	31,115	43	3,309	6,831
Centre	17,350	52	1,455	4,185
Chester	92,644	11	55,097	35,164
Clarion	43,177	35	1,136	15,748
Clearfield	32,751	41	952	7,940
Clinton	8,544	56	765	3,985
Columbia	60,953	25	7,482	16,128
Crawford	53,752	30	3,940	9,633
Cumberland	67,125	19	33,683	26,428
Dauphin	70,795	18	28,190	27,538
Delaware	24,954	46	16,421	10,680
Elk	1,395	63	22	306
Erie	81,578	15	7,932	10,501
Fayette	58,938	26	19,817	12,141
Forest	756	64	17	224
Franklin	134,375	6	86,483	39,390
Fulton	24,310	48	6,935	8,799
Greene	55,197	28	25,285	13,357
Huntingdon	41,410	38	10,483	24,020
Indiana	79,342	17	3,854	35,680
Jefferson	43,056	36	1,929	12,803
Juniata	41,699	37	9,997	13,545
Lackawanna	12,141	54	822	3,181
Lancaster	88,403	13	33,633	50,195
Lawrence	61,794	22	4,459	20,422
Lebanon	31,775	42	17,615	24,822
Lehigh	51,981	32	12,854	20,818
Luzerne	91,240	12	6,978	16,140
Lycoming	55,471	27	10,782	17,822
McKean	93	66	9	34
Mercer	60,967	23	4,069	23.689
Mifflin	10,784	55	3,285	6.565
Monroe	23,204	50	430	7,348
Montgomery	103,711	9	91,945	33,589
Montour	22,241	51	3,444	6,073
Northampton	64,979	20	9,720	23,096
Northumberland	60,956	24	20,415	18,131
Perry	38,709	39	11,809	10,372
Philadelphia	5,953	59	3,361	1,361
Pike	1,575	62	198	1,325
Potter	90	67	13	436

Schuylkill	46,476	34	9,785	26,672
Snyder	83,963	14	23,965	16,478
Somerset	14,515	53	390	5,493
Sullivan	2,317	60	234	948
Susquehanna	8,673	58	529	3,116
Tioga	9,201	57	1,562	1,845
Union	25,210	45	11,871	3,729
Venango	29,097	44	944	6,210
Warren	2,076	61	60	634
Washington	93,985	10	44,571	30,226
Wayne	23,290	49	3,176	3,907
Westmoreland	127,099	7	18,335	40,463
Wyoming	53,114	31	7,898	16,163
York	150,755	3	71,264	66,439

PEARS IN PENNSYLVANIA: Number of trees, 1920, and production, 1919, by counties.

County	Trees of bearing age	Rank in number of bearing trees	Bushels harvested	Trees not of bearing age
Allegheny	29,655	2	2,103	9,654
Berks	30,234	1	27,846	8,013
Bucks	26,448	3	28,131	8,464
Cambria	21,057	10	2,327	8,166
Chester	23,221	8	22,735	6,438
Erie	21,842	9	6,581	4,539
Lancaster	25,638	5	35,497	7,156
Montgomery	26,196	4	38,290	9,113
Westmoreland	23,691	6	1,034	9,007
York	23,519	7	29,771	8,501

PLUMS & PRUNES IN PENNSYLVANIA: Number of trees, 1920, and production, 1919, by counties.

County	Trees of bearing age	Rank in number of bearing trees	Bushels harvested	Trees not of bearing age
Allegheny	34,848	4	471	10,694
Armstrong	27,383	7	316	6,273
Bedford	20,504	9	539	3,955
Butler	29,572	5	143	7,374
Erie	54,925	1	7,659	17,878
Greene	25,117	8	3,234	2,695
Indiana	40,037	2	253	10,917
Washington	28,292	6	1,410	8,202
Westmoreland	37,753	3	254	10,574

CHERRIES IN PENNSYLVANIA: Number of trees, 1920, and production, 1919, by counties.

County	Trees of bearing age	Rank in number of bearing trees	Bushels harvested	Trees not of bearing age
Allegheny	38,601	3	1,921	9,364
Armstrong	34,119	5	524	6,095
Berks	28,589	7	10,053	6,937

Butler	30,323	6	141	7,376
Erie	67,568	1	18,070	15,089
Lancaster	34,360	4	18,175	7,505
Somerset	27,479	8	130	3,212
Westmoreland	43,269	2	391	5,537
York	26,881	9	13,245	5,628

GRAPES IN PENNSYLVANIA: Number of vines, 1920, and production, 1919, by counties.

County	Vines of bearing age	Rank in number of bearing vines	Pounds harvested	Vines not of bearing age
Allegheny	177,113	2	251,234	28,435
Beaver	74,817	3	297,541	13,332
Berks	31,010	9	512,503	4,454
Erie	6,423,055	1	33,439,652	197,125
Fayette	37,158	7	111,460	3,908
Lancaster	48,202	6	722,422	5,954
Washington	61,958	5	243,894	13,996
Westmoreland	70,520	4	230,853	16,663
York	31,139	8	327,733	10,048

STRAWBERRIES IN PENNSYLVANIA: Acreage and quarts harvested, 1919, by counties.

County	Rank	Acres	Quarts	County	Rank	Acres	Quarts
Allegheny	1	282	442,511	Mercer	8	119	287,858
Berks	5	154	328,101	Montgomery	9	118	163,801
Crawford	10	116	196,736	Schuylkill	7	124	317,009
Erie	4	161	257,029	Washington	6	148	194,392
Lancaster	3	189	402,351	York	2	239	637,034

RASPBERRIES IN PENNSYLVANIA: Acreage and quarts harvested 1919, by counties.

County	Rank	Acres	Quarts	County	Rank	Acres	Quarts
Allegheny	5	87	37,869	Greene	8	77	33,444
Berks	10	73	86,290	Lancaster	3	112	166,853
Bradford	4	103	83,787	Mercer	10	73	31,414
Crawford	7	78	53,496	Snyder,	9	75	70,362
Erie	1	255	277,403	Wyoming	6	79	72,617
York,	2	167	287,836				

BLACK BERRIES IN PENNSYLVANIA: Acreage and quarts harvested, 1919, by counties.

County	Rank	Acres	Quarts	County	Rank	Acres	Quarts
Allegheny	5	66	28,509	Greene,	3	95	25,433
Beaver	7	51	43,538	Lancaster	10	41	49,330
Chester	8	47	29,244	Washington	2	109	55,659
Erie	6	58	45,300	Westmoreland	1	232	58,736
Fayette	4	92	27,080	York	9	43	57,109

APPLES IN THE UNITED STATES: Number of trees, 1920, by states in order of rank.

Trees of bearing age.

State	Rank	Number	State	Rank	Number
New York	1	9,636,698	Illinois	9	5,112,866
Washington	2	7,964,167	Arkansas	10	4,074,870
Virginia	3	7,385,277	Kentucky	11	3,742,936
Pennsylvania	4	6,981,128	North Carolina	12	3,474,821
Ohio	5	5,970,410	Indiana	13	3,427,816
Michigan	6	5,583,326	Oregon	14	3,315,093
West Virginia	7	5,554,731	Tennessee	15	3,181,659
Missouri	8	5,162,859			

Trees not of bearing age.

State	Rank	Number	State	Rank	Number
New York	1	2,932,281	Kentucky	9	1,427,408
Virginia	2	2,857,007	North Carolina	10	1,394,588
Pennsylvania	3	2,603,516	California	11	1,143,947
Michigan	4	2,051,129	Tennessee	12	1,032,490
Ohio	5	2,047,687	Indiana	13	929,160
Illinois	6	1,825,886	Arkansas	14	877,376
West Virginia	7	1,735,126	Wisconsin	15	825,258
Missouri	8	1,585,823			

PEACHES IN THE UNITED STATES: Number of trees, 1920, by states in order of rank.

Trees of bearing age.

State	Rank	Number	State	Rank	Number
California	1	9,057,760	Missouri	9	2,358,925
Georgia	2	8,655,051	Tennessee	10	2,349,656
Texas	3	4,461,211	West Virginia	11	2,049,862
Pennsylvania	4	3,556,417	Michigan	12	2,029,839
Arkansas	5	3,342,287	North Carolina	13	1,976,756
New York	6	3,038,023	New Jersey	14	1,936,632
Ohio	7	2,924,177	Kentucky	15	1,671,044
Oklahoma	8	2,881,073			

Trees not of bearing age.

State	Rank	Number	State	Rank	Number
Georgia	1	3,391,851	Illinois	9	840,900
Texas	2	1,641,191	Virginia	10	783,733
California	3	1,366,941	Michigan	11	772,101
Pennsylvania	4	1,231,633	Missouri	12	716,325
North Carolina	5	1,093,993	Kentucky	13	690,483
Arkansas	6	988,966	Tennessee	14	690,359
Ohio	7	970,183	West Virginia	15	651,742
New Jersey	8	884,067			

PEARS IN THE UNITED STATES: Number of trees, 1920, by states in order of rank.

Trees of bearing age.

State	Rank	Number	State	Rank	Number
New York	1	2,778,761	Illinois	9	435,707
California	2	2,305,646	Texas	10	435,684
Michigan	3	1,029,735	Missouri	11	376,208
Washington	4	866,634	Indiana	12	337,515
Pennsylvania	5	753,632	Virginia	13	311,199
Oregon	6	727,444	Maryland	14	305,510
Ohio	7	616,416	Delaware	15	249,375
New Jersey	8	480,601			

Trees not of bearing age.

State	Rank	Number	State	Rank	Number
California	1	2,178,526	Ohio	9	147,892
New York	2	967,573	North Carolina	10	129,104
Michigan	3	302,734	Missouri	11	101,994
Pennsylvania	4	237,643	Georgia	12	83,474
Oregon	5	214,523	Kansas	13	79,957
Washington	6	183,346	Virginia	14	79,561
Texas	7	182,394	New Jersey	15	77,026
Illinois	8	148,810			

PLUMS AND PRUNES IN THE UNITED STATES: Number of trees, 1920, by states in order of rank.

Trees of bearing age.

State	Rank	Number	State	Rank	Number
California	1	8,768,436	Ohio	9	459,265
Oregon	2	2,999,480	Michigan	10	377,123
Washington	3	875,363	Iowa	11	313,769
Pennsylvania	4	767,646	Arkansas	12	292,323
New York	5	745,889	Kentucky	13	282,831
Idaho	6	552,595	Tennessee	14	281,127
Missouri	7	523,649	Illinois	15	273,554
Texas	8	480,810			

Trees not of bearing age.

State	Rank	Number	State	Rank	Number
California	1	5,237,145	Oklahoma	10	104,410
Oregon	2	1,331,606	Minnesota	11	102,929
Washington	3	309,230	Iowa	12	95,356
Texas	4	242,800	Idaho	13	80,485
Pennsylvania	5	233,384	Illinois	14	79,615
New York	6	205,702	Arkansas	15	70,264
Missouri	7	144,651	Arkansas	16	885,539
Michigan	8	142,657	Pennsylvania	17	851,606
Ohio	9	129,713			

CHERRIES IN THE UNITED STATES: Number of trees, 1920, by states in order of rank.

Trees of bearing age.

State	Rank	Number	State	Rank	Number
Michigan	1	1,076,748	Wisconsin	9	437,480
New York	2	1,027,203	Kansas	10	395,436
Pennsylvania	3	951,924	Oregon	11	395,073
Ohio	4	805,838	Iowa	12	391,226
California	5	657,470	Colorado	13	348,832
Illinois	6	536,458	Washington	14	329,187
Missouri	7	522,026	Nebraska	15	289,221
Indiana	8	475,333			

Trees not of bearing age.

State	Rank	Number	State	Rank	Number
Michigan	1	351,892	Indiana	9	132,006
California	2	347,572	Iowa	10	130,199
Missouri	3	333,180	Nebraska	11	120,194
New York	4	279,864	Oklahoma	12	101,091
Illinois	5	217,124	Tennessee	13	98,714
Pennasylvania	6	217,046	Oregon	14	89,396
Ohio	7	195,187	Wisconsin	15	84,215
Kansas	8	184,093			

GRAPES IN THE UNITED STATES: Number of vines, 1920, by states in order of rank.

Vines of bearing age.

State	Rank	Number	State	Rank	Number
California	1	153,195,213	Iowa	9	1,401,613
New York	2	30,677,555	Kansas	10	1,206,933
Michigan	3	11,097,734	Oklahoma	11	923,609
Pennsylvania	4	7,462,067	Indiana	12	744,043
Ohio	5	6,553,904	Arkansas	13	607,244
Missouri	6	2,444.907	North Carolina	14	543,734
Illinois	7	1,642,527	Washington	15	467,761
New Jersey	8	1,477,617			

Vines not of bearing age.

State	Rank	Number	State	Rank	Number
California	1	21,388,646	New Jersey	9	194,562
New York	2	1,389,042	Kansas	10	183,151
Michigan	3	607,149	Illinois	11	180,172
Ohio	4	521,207	Texas	12	164,627
Missouri	5	410,604	Nebraska	13	126,765
Pennsylvania	6	402,271	North Carolina	14	114,582
Iowa	7	304,710	Virginia	15	112,197
Oklahoma	8	200,894			

SMALL FRUITS IN THE UNITED STATES: Total acreage in Strawberries, Raspberries, Loganberries, Blackberries, Dewberries, Currants, and other berries, 1919.

State	Rank	Acres	State	Rank	Acres
Michigan	1	21,021	Ohio	9	9,447
New York	2	20,412	Pennsylvania	10	8,680
Missouri	3	16,768	Oregon	11	8,463
New Jersey	4	15,374	Maryland	12	8,360
Tennessee	5	12,544	Wisconsin	13	7,991
Illinois	6	11,215	California	14	7,936
Arkansas	7	9,873	Iowa	15	7,885
Massachusetts	8	9,628			

RASPBERRIES IN THE UNITED STATES: Production, 1919.

State	Rank	Quarts	State	Rank	Quarts
Oregon	1	12,022,912	Missouri	9	1,592,556
New York	2	11,674,978	California	10	1,538,024
Michigan	3	7,657,819	Minnesota	11	1,516,147
Washington	4	5,757,456	Iowa	12	1,428,396
Ohio	5	2,773,819	Indiana	13	1,251,652
Pennsylvania	6	2,569,789	Wisconsin	14	1,085,881
New Jersey	7	2,083.925	Kansas	15	919,880
Illinois	8	1,945,336			

STRAWBERRIES IN THE UNITED STATES: Production, 1919.

State	Rank	Quarts	State	Rank	Quarts
Tennessee	1	13,130,904	Pennsylvania	9	7,184,096
Missouri	2	12,861,820	Ohio	10	7,165,957
Michigan	3	12,585,543	Illinois	11	6,901,199
Arkansas	4	11,463,971	Iowa	12	6,606,592
California	5	10,808,048	Washington	13	6,377,368
Maryland	6	8,976,059	Louisiana	14	5.323,890
New York	7	8,579,563	Wisconsin	15	5,203,127
New Jersey	8	8,301,893			

BLACKBERRIES AND DEWBERRIES IN THE UNITED STATES: Production, 1919.

State	Rank	Quarts	State	Rank	Quarts
Texas	1	6,287,333	New York	9	1,711,546
Washington	2	3,691,065	Oklahoma	10	1,531,810
Missouri	3	2,958,006	Ohio	11	1,481,447
California	4	2,549,082	Illinois	12	1,365,223
Michigan	5	2,452,909	Tennessee	13	1,200,981
Oregon	6	2,139,110	Indiana	14	1,087,317
New Jersey	7	2,045.521	North Carolina	15	936,251
Kentucky	8	1,778,468			

SPRAYING SCHEDULE FOR FRUITS

Bb H. E. Hodgkiss and C. R. Orton, State College, Pa.

Apple

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Delayed dormant  FIG. 4 When leaves of blossom buds are out ¼ to ½ inch	Lime-Sulphur to test1.03 Sp. G.; Black Leaf 40 ¾ pint; Arsenate of lead powder, 3 pounds.	San Jose, Oyster Shell and Scurfy Scales, Rosy apple aphis, Bud moths, Leaf-rollers.
Blossom Pink  FIG. 5 When blossoms show pink. At the separation of the cluster buds.	Lime-Sulphur to test 1.008 Sp. G.; Arsenate of lead powder, 3 pounds.	Apple scab, Frog eye, Bud moths, Leaf-rollers, Curculio.
Petal Fall  FIG. 6 When 2/3 of the petals have fallen.	Lime-Sulphur to test 1.008 Sp. G.; Black Leaf 40 1 pint; Arsenate of lead powder 3 pounds.	Apple scab, Frog eye, Codling moth, Red bug, Curculio.
Cluster Apple  FIG. 7 Two weeks later, or when the young apples are the size of hazel-nuts.	Repeat "Petal Fall" spray, or substitute Bordeaux 3-4-50 for Blotch.*	Apple blotch Scab, Frog eye, Red bug, Curculio, Apple maggot.
Mid-summer  FIG. 8 Late in July or early in August.	Lime-Sulphur to test 1.008 Sp. G.; Arsenate of lead powder 3 lbs. Substitute Bordeaux for Blotch and Bitter Rot.*	Fruit spot, Sooty fungus, Apple blotch, Bitter rot, Codling moth, Curculio, late apple worms.

* If blotch and bitter rot are present an application should be made using Bordeaux Mixture two weeks after the cluster apple spray.

Peaches

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Dormant  FIG. 9 Before buds begin to swell in winter or spring.	Lime-Sulphur to test 1.03 Sp. G.	Leaf curl, San Jose scale.
Calyx Drop  FIG. 10 When shucks are dropping.	Self-boiled lime sulphur, Arsenate of lead powder 2 pounds.	Scab, Brown rot, Curculio.
 FIG.11 Two or three weeks later.	Self-boiled lime sulphur, Arsenate of lead powder 2 pounds.	Scab, Brown rot, Curculio.
 FIG. 12 Four or five weeks before fruit ripens.	Self-boiled lime sulphur.	Brown rot.

Pears

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Cluster Bud  FIG 13 When blossom buds separate in the cluster.	Lime-Sulphur to test 1.03 Sp. G.	Scab, Black spot, Scale, Psylla eggs.
Petal Fall  FIG. 14 Just after petals are fallen.	Lime-Sulphur to test 1.008 Sp. G.; Arsenate of lead powder 3 pounds.; Black Leaf 40 1 pint.; or if psylla nymphs are abundant make a separate application of the nicotine and 4 pounds of dissolved soap.	Scab, Black spot, Leaf spot, Codling moth, Psylla nymphs.
Cluster Pear  FIG. 15 Two weeks after petal fall.	Lime-Sulphur to test 1.008 Sp. G.; Arsenate of lead powder, 3 pounds.	Scab, Black spot, Leaf spot.
Emergency Spray For psylla nymphs. Apply when infestation is serious during summer.	Lime 30—60 lbs. Copper sulphate 2 lbs. Black Leaf 40 1 pint, water 100 gallons.	Summer brood of psylla.

Flemish Beauty, Seckel,and other varieties subject to scab should receive the first three sprays; on Bartlett and Keiffer only the first two need be applied.

Cherries

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Delayed dormant  FIG. 20 When green ends of blossom buds show.	Lime-Sulphur to test 1.03 Sp. G., Black Leaf 40 1 pint or Black Leaf 40 1 pint., soap 4—5 pounds (Sweet cherries only)	Scale, Aphis. Aphis.
Petal Fall  FIG. 21 When petals fall.	Self-boiled lime sulphur, Arsenate of lead powder 2½ pounds.	Leaf spot, Brown rot, Curculio.
Calyx Drop  FIG. 22 When shucks are dropped.	Self-boiled lime sulphur, Arsenate of lead powder 2½ pounds.	Leaf spot, Brown rot, Curculio.
Fruit  FIG. 23 Just before cherries turn red.	Self-boiled lime sulphur, Arsenate of lead powder 2½ pounds.	Leaf spot, Brown rot, Fruit fly.
After picking.	Self-boiled lime sulphur, Arsenate of lead powder 1—2 pounds.	Leaf spot, Cherry slug.

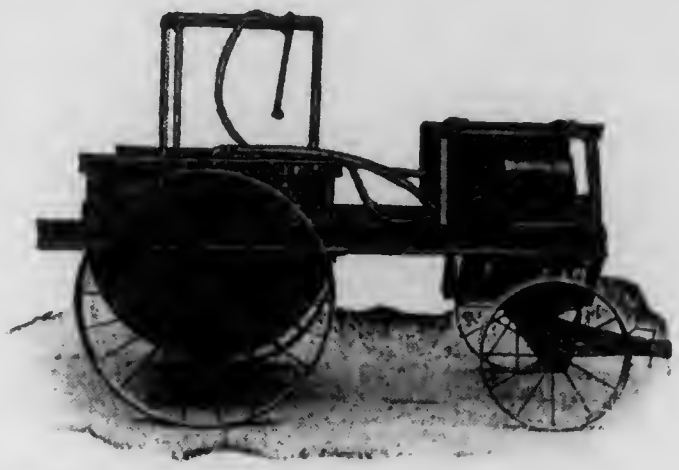
Plums

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Dormant  FIG. 16 While buds are dormant.	Lime-Sulphur to test 1.03 Sp. G.	San Jose Scale.
Calyx Drop  FIG. 17 When shucks are dropped*.	Self-boiled lime sulphur, Arsenate of lead powder 2½ pounds.	Brown rot, Leaf spot, Curculio.
 FIG. 18 Ten to twenty days later.	Self-boiled lime sulphur.	Brown rot, Leaf spot,
 FIG. 19 Before fruit ripens.	Self-boiled lime sulphur.	Brown rot, Leaf spot.

Where curculio is causing severe damages it may be advisable to apply an earlier spray in addition to this application. This spray should be made just after the blossom petals drdop and using the same materials.

Grapes

Period for spraying	Materials for 100 gallons of spray.	Diseases and Insects Controlled.
Just before buds open.	Bordeaux Mixture 8-6-100, Arsenate of lead powder 1½ pounds.	Anthracnose, Flea beetles, Powdery mildew, Dead arm.
Just before blooming.	Bordeaux Mixture 8-6-100,	Downy Mildew, Powdery Mildew, Black rot, Anthracnose.
Just after fruit has set.	Bordeaux Mixture 8-6-100, Arsenate of lead powder 3 lbs. Resin fish oil soap 3 lbs.	Rots, Berry moth, Root worm.
About ten days later.	Bordeaux Mixture 8-6-100,	Rots.
In about two weeks.	Bordeaux Mixture 8-6-100,	Rots.
When most nymphs are present (July 10-15).	Bordeaux Mixture 8-6-100, Black Leaf 40 ½ pint.	Leaf-hoppers.
When beetles are present.	Lead arsenate powder 2 lbs., cheap molasses 2 gallons.	Rose chafer.



You will always be GLAD you bought a

"Friend" Sprayer

The Celebrated "Friend" Type LEADS THE WORLD

Because "Friend" sprayers are made for the discriminating grower exactly like a fine suit of clothes is tailored for the President.

One Model and One Size Will Not Do for All

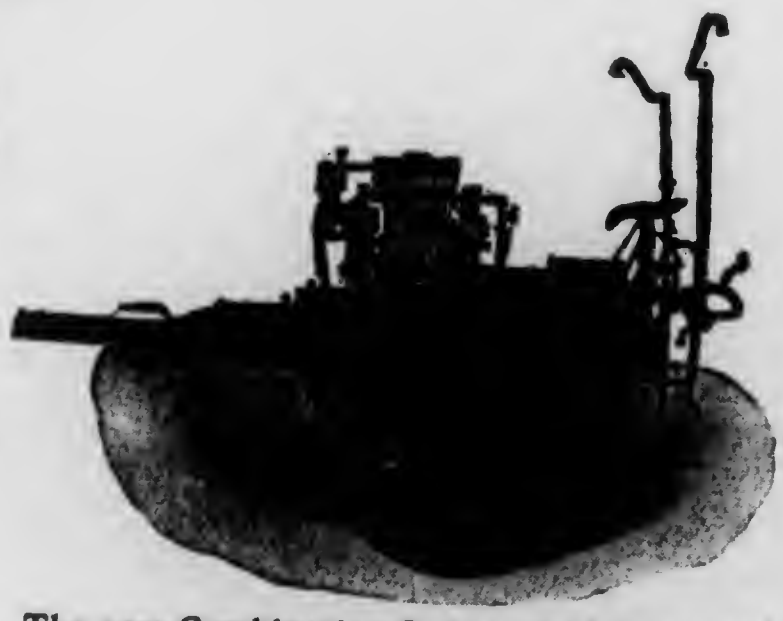
The "Friend" Manufacturing Company and its distributor, Tyson Brothers Incorporated, form an organization of SPRAYER COUNCIL.

It matters not what you have to spray, let

"FRIEND"

TYSON

Tell you how to do it.



The new Combination Sprayer with Improved Nixon "Friend" nozzle boom.

"Friend" Manufacturing Company, Mfrs.

Tyson Brothers, Incorporated, Distributors

Gasport, N. Y. **Flora Dale, Pa.**

END OF YEAR